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WILDLIFE REVIEW

NUMBER 89 AUGUST 1957

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

WILSON ORNITHOLOGICAL CLUB

WILDLIFE REVIEW

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Except as indicated, abstracts are by William H. Stickel, editor.

NATURAL RESOURCES & CLIMATE

Gunter, Gordon. (Gulf Coast Res. Lab., Ocean Springs, Miss.) LAND, WATER, WILDLIFE AND FLOOD CONTROL IN THE MISSISSIPPI VALLEY. Proc. La. Acad. Sci. 19: 5-11. 1956. [From Biol. Abs. 31(5).]

The author urges a compromise, rather than a continued fight, with the Mississippi River. Curbing the flow of the river with extensive levee systems has not only been expensive but wasteful of the river as a natural resource. The river should be used as a land builder, a supplier of water for vaster areas and as a creator of wildlife and aquatic resources; not solely as a "sewer," local water supply and navigation channel.--Author.

Hertzler, J. O. (U. Nebr.) THE CRISIS IN WORLD POPULATION. U. Nebr. Press. 279 p. 1956. $5.00. [From review in J. Soil & Water Cons. 12(3).]

At the present rate of increase the human population of the world will double in 58 years--from 2-1/2 billion to 5 billion. What are the reasons and what can be done? "The author has given primary consideration to the more important underlying factors and processes involved in the world's phenomenal increase in population in recent centuries. Other points of interest give emphasis to the social and scientific principles relating to the changes, some of their effects, and the resulting national and international problems and a review of proposals advanced to cope with the situation. Two chapters are devoted to the so-called underdeveloped countries, constituting about two-thirds of the world's population, where conditions are serious. Other sections of the book cover excellent discussions on Increasing the World's Food Supply, Migration as a Possible Solution of Population Pressure and World Fertility Reduction. Generally, the author is not highly optimistic as to an early solution of the many involved problems. He points out, for example, that 'when there are five more persons in the world every four seconds, the finiteness of the earth becomes a matter of paramount concern regardless of man's ingenuity in utilizing its resources.'"

CONSERVATION EDUCATION

Nagel, Werner O. (Mo. Cons. Comm.) HABITAT IMPROVEMENT - KEY TO GAME ABUNDANCE. Natl. Wildl. Fed., Wash. 12, D. C. 22 unnumbered p., illus. 1956. 10¢.

A popular pamphlet designed to show the layman what the fundamentals of wildlife conservation are. First it takes up the importance of food, cover, water, and living space, and briefly explains carrying capacity. It tells how and why habitat is declining, with special attention to loss of soil fertility and drainage evils. It tells why restocking and predator control are not cure-alls. As compared with restocking and predator control, "Habitat improvement is neither so easy, attractive, nor spectacular, but it has one advantage the others do not--it works!" To use habitat improvement effectively we need plenty of research, wide distribution of information, good planning, and coordination of land-use programs. In closing, 9 courses of lay action are outlined for spreading the right kind of thinking and supporting good public and private programs.

Sponsored by Montana Conservation Council and State Board of Education. SUGGESTED ACTIVITIES FOR THE TEACHING OF THE CONSERVATION OF NATURAL RESOURCES. Reporter Printing and Supply Co., 1402 1st Ave. N., Billings, Mont. 47 p., illus. 1956. $1.00. [From Outdoor News Bul. 11(8).]

Deals with resources of Mont., but many of the examples, experiments, suggested activities, and illustrations should be applicable elsewhere. Contains more than 125 demonstrations, projects, ideas for field trips, and tested teaching suggestions. All have been used with youngsters of various age groups and with some types of adult programs. This booklet and a related one, "The Conservation of Montana's Natural Resources," are sold together for $1.75.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

Anon. NATIONAL ORGANIZATIONS RELATED TO NATURE CONSERVATION. Nature Conservancy (4200 22nd St. NE., Wash. 18, D. C.) Information Bul. no. 1, revised. 9 p., mimeo. Apr. 1957.

Lists names, addresses, fields of interest, and journal series of 64 national societies and institutes that are concerned with such subjects as forest management, natural areas, wilderness, parks, planning, human populations, conservation education and publicity, recreation, soil, water, and wildlife.

Boles, Donald Edward. ADMINISTRATIVE RULE MAKING IN WISCONSIN CONSERVATION. Ph.D. thesis, U. Wis. 335 p. 1956. [From long abstract in Dissertation Abstracts 16(10).]

History of evolution of regulatory authority of Wis. Cons. Comm. and analysis of how the system now operates.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Cooper, Charles F. (Duke U., Durham, N. C.) THE VARIABLE PLOT METHOD FOR ESTIMATING SHRUB DENSITY. J. Range Mgt. 10(3): 111-115, 2 figs. May 1957.

Summary: "The variable-plot method can be used to estimate shrub density in percent without measurement of distance or area. This method is faster and easier to apply than any of the standard shrub-estimating procedures now in common use. In tests in three different vegetation types, it closely approximated the estimates obtained by other sampling methods. It is most reliable in open shrub stands with a density of less than 35 percent; beyond that point accuracy falls off rapidly. Variable plot data are subject to statistical analysis, and are particularly useful in calculating an index of dispersion. The variable-plot method appears to be a practical means of reducing the labor required in collecting field data on shrub density."

Leach, Wm. PLANT ECOLOGY. 4th edition. John Wiley & Sons, 440 4th Ave., N. Y. 16, N. Y. 106 p. 1956. $2.00. [From review in A.I.B.S. Bul. 7(3).]

"This pocket-size volume outlines the essential principles and practices of plant ecology in a brief but quite adequate fashion. The book is obviously not meant for advanced students of ecology, but should make fine introductory or supplementary reading. The fourth edition has been completely revised and largely rewritten, although the examples of plant community flora remain British."

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Cooley, George R. (Rensselaerville, N. Y.) THE VEGETATION OF SANIBEL ISLAND, LEE COUNTY, FLORIDA. Rhodora 57(682): 269-289, 18 photos, 3 maps, 1 fig. Oct. 1955.

Good discussion of origin and habitats of the island and list of plants. List has indication of abundance in each of 7 major habitats.

Fassett, Norman C. (U. Wis.) A MANUAL OF AQUATIC PLANTS. U. Wis. Press. ix + 405 p., illus. 1957. $6.50. [From Biol. Abs. 31(6).]

This new edition of the late Dr. Fassett's text has an appendix by E. C. Ogden which brings the nomenclature into agreement with present-day usage as indicated by Fernald's revision of Gray's Manual, Gleason's revision of the Britton and Brown Illustrated Flora, Muenscher's Aquatic Plants of the United States, and by recent local floras and monographic treatments, including several by Fassett. Part I of the book is a General Key (33 pages), Part II the Descriptive Treatment (306 pages). There are a great number of line drawings, arranged on over 200 pages, besides smaller groups of drawings and photographs. Available information concerning the use of plants by birds and mammals is given in a special section which has a list of plants, together with the names of animals which use them; each entry is followed by numbers that refer to the original papers in the bibliography. There is also an animal index in which the numbers listed after each name refer to the plant list. Another list and bibliography are concerned with the relation of plants to fish. The book has a glossary and a general index.--R. Bloch.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY--Continued

Fassett, Norman C. (U. Wis.) SPRING FLORA OF WISCONSIN. A MANUAL OF PLANTS GROWING WITHOUT CULTIVATION AND FLOWERING BEFORE JUNE 15. 3rd ed. U. Wis. Press. vi + 189 p., illus. 1957. $2.50. [From Biol. Abs. 31(6).]

The third edition of this field manual was revised by Margaret S. Bergseng. There is an introduction dealing with classification, use of keys, and suggestions for collecting and pressing plants. Next there is a key to families, followed by the Descriptive Spring Flora. Twenty-nine plates with 415 line drawings facilitate identification. The index is preceded by a glossary.--R. Bloch.

Fuller, George D., reviser. FOREST TREES OF ILLINOIS; HOW TO KNOW THEM. A POCKET MANUAL DESCRIBING THEIR MOST IMPORTANT CHARACTERISTICS. Ill. Dept. Cons., Div. For. 71 p., illus. 1955. [From Monthly Checklist of State Publ. 48(5).]

Hamilton, Ernest Scovell. QUANTITATIVE VEGETATIONAL STUDIES ON SLOPES OF CONTRASTING EXPOSURE IN NORTHERN NEW JERSEY. Ph.D. thesis, Rutgers U. 102 p. 1956. [From abstract in Dissertation Abstracts 16(10).]

McDougall, W. B., and Herma A. Baggley. PLANTS OF YELLOWSTONE NATIONAL PARK. 2d edition, thoroughly revised. Yellowstone Libr. & Mus. Assn., Yellowstone Park, Wyo., Yellowstone Interpretive Ser. no. 8. xi + 186 p., 5 figs., 144 photos (many colored). 1956. $3.50 cloth, $2.50 paper.

Flora with keys or equivalent comparisons for identification of all species of seed plants, of which there are more than 1000 in Yellowstone. Keys are no more technical than need be and technicalities are explained briefly. In addition to the keys, a little general information is given, chiefly on families, genera, or interesting species. The many color photos are an outstanding feature. The book is intended for lay or professional use, but since it consists largely of keys, people without botanical training are not likely to use much more than the photographs.

Potter, Loren D. (N. Dak. Agr. Coll., Fargo.) PHYTOSOCIOLOGICAL STUDY OF SAN AUGUSTIN PLAINS, NEW MEXICO. Ecol. Monog. 27(2): 113-136, 11 figs. Apr. 1957.

"Reported here is the distribution and composition of the vegetational types within the drainage basin, and a discussion of pertinent climatic and edaphic factors." Vegetational types vary from desert brush and grass to pine, with about 42% of the area being grama grassland.

Twisselmann, Ernest C. (Cholame, Calif.) A FLORA OF THE TEMBLOR RANGE AND THE NEIGHBORING PART OF THE SAN JOAQUIN VALLEY. Wasmann J. Biol. 14(2): 161-300, 1 map, 36 photos. Fall 1956.

A long, simply-written account that appeals as more interesting and informative in respect to nontaxonomic matters than most floras. It gives an excellent picture of the area and its plant associations and an annotated list of species. The 36 photos are both helpful and interesting.

Wagenknecht, Burdette L. (State U. Iowa.) THE FLORA OF WASHINGTON COUNTY, IOWA. Proc. Iowa Acad. Sci. 51: 184-204. 1954. [From Biol. Abs. 31(2).]

PLANTS--FOREST SURVEYS

Anon. FORESTS OF EAST OKLAHOMA, 1955-56. US For. Serv., S. For. Exp. Sta., For. Surv. Rel. 79. ii + 34 p., 8 figs. June 1957.

"Commercial forest area in east Oklahoma totals 5.6 million acres. Hardwood forest types predominate. Growing stock volume totals 1.3 billion cubic feet, an average of 3 cords per acre. Sawtimber volume of 4 billion board feet is equally divided between pine and hardwood. It averages 713 board feet per acre. Timber growth is 107 million cubic feet annually. The 1955 cut was 29 million cubic feet. Growth of both pine and hardwood sawtimber exceeded the cut. In the Ouachita Mountain region, softwood sawtimber volume is about the same as in 1936; softwood growing stock has increased by some 15 percent."

PLANTS--FOREST SURVEYS--Continued

Bryan, Mackay B. FOREST STATISTICS FOR THE COASTAL PLAIN OF VIRGINIA, 1956. US For. Serv., SE. For. Exp. Sta. (Asheville, N. C.), For. Surv. Rel. no. 50. II + 42 p., 5 figs. June 1957.

Haden-Guest, Stephen, John K. Wright, and Eileen M. Teclaff. A WORLD GEOGRAPHY OF FOREST RESOURCES. Ronald Press Co., N. Y. 10, N. Y. xviii + 736 p., illus. 1956. $12.50. [From Biol. Abs. 31(7).]
The American Geographical Society has sponsored the present compendium on world forests by 35 contributors. The main part of the book is 25 chapters (518 pages) dealing with regions of the world. Worldwide aspects of forests and their products are dealt with in 6 chapters: importance of forests to man, forests of the past, forest influences, principles and practices, products industries, and outlook for the world's forests and their chief products. The regional chapters treat of the forests, their types, quantity and quality; goods and services derived from them; their ecology, influences, relations to human needs and desires, and the role of institutions and conflicting uses on problems of management for sustained yield. Each paper has a selected list of references and appropriate illustrative material. The book closes with a general bibliographic note, including a list of published regional forest maps, an index of scientific names of cited plant species, and general index.--S. A. Cain.

Larson, Robert W. NORTH CAROLINA'S TIMBER SUPPLY, 1955. US For. Serv., SE. For. Exp. Sta. (Asheville, N. C.), For. Surv. Rel. no. 49. iv + 71 p., 12 figs., large colored map of forest types. Mar. 1957.
Readable text and a great deal of tabular data, much of which is for counties or species of trees. The state now has 1.2 million acres more forest land than in 1938, owing to abandonment of farmland. It has 1/3 more hardwood growing stock and 20% more yellow-pine pole timber. On the other hand, it has 1.6 million acres less of pine and oak-pine types. Pine sawtimber decreased 6%. Volume in cull trees rose 36%. Since 1938, growth has increased substantially and cut has decreased slightly. Growth exceeds cut of all important groups. But less desirable types of timber are increasing so much faster than types wanted by industry that the state faces a possible shortage of space for growing the pine and good hardwood timber that will be needed. Some of the remedies suggested are planting, upgrading of poor stands, finding uses for low-grade timber, and making better use of what is cut.

Spada, Benjamin, and James T. Bones. FOREST STATISTICS FOR SNOHOMISH COUNTY, WASHINGTON. US For. Serv., Pac. NW. For. & Range Exp. Sta. (Portland 8, Ore.), For. Surv. Rep. no. 128. ii + 30 p., map. May 1957.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Breland, Osmond P. ANIMAL FRIENDS AND FOES. Harper & Bros., N. Y. 259 p., illus. 1957. $3.95. [From review by Monica de la Salle, Aud. Mag. 59(3).]
"...unfolds much curious and interesting knowledge about mammals, birds, reptiles, amphibians, fishes, insects, mollusks, and other creatures. As the title indicates, its purpose is to shed light on the economic value of animals--none of which, of course, can be classified as 'good' or 'bad,' since beneficial effects may ensue even from what at the time appears reprehensible."

Collins, Stephen. THE BIOTIC COMMUNITIES OF GREENBROOK SANCTUARY. Ph.D. thesis, Rutgers U. 350 p. 1956. [From abstract in Dissertation Abstracts 16(10).]
See next entry.

Collins, Stephen. (633 Orange St., New Haven, Conn.) THE BIOTIC COMMUNITIES OF GREENBROOK SANCTUARY. Palisades Nature Assn., Box 230, Englewood, N. J. 112 p., 82 illus., 2 folding maps. 1957. $2.50.
Description of 7 communities of a 150-acre forested sanctuary in N. J. part of Palisades Interstate Park. Relates vegetation to land-use, fire, storm, and animal factors. Hemlock-hardwood invasion of oak forest is attributed to (1) modern trend in fire reduction, and (2) changing seedbed conditions on windfall

mounds of large trees. The history of cutting, burning, clearing, grazing, and human habitation makes it unnecessary to ascribe vegetation trends to climatic change. Upland vegetation of the area will not return to "oak-hickory climax" (attributed to annual burning by Indians), but will have increasingly northern affinities, with dominants such as hemlock, birch, and maple. The present oak forest is of sprout origin. It was caused by repeated cutting and burning and is composed of defective trees. High breakage and toppling of old oaks favor release of hemlocks and their associates. Other communities include swamps, cliff edge, vine tangles, talus slopes, and areas recently disturbed by man. Extensive browsing of oak reproduction by rabbits and heavy use of acorns by other wildlife may contribute to suppression of the oak element. Burned areas produce more attractive browse for deer than do unburned areas and possibly have more trees that provide dens and nest holes. Census of breeding birds shows that animal distribution is closely associated with the pattern of communities. Alternate methods of management for the sanctuary are discussed.--Author.

Edwards, J. Gordon. (San Jose State Coll., Calif.) SOME GENERAL OBSERVATIONS ON THE ECOLOGY OF GLACIER NATIONAL PARK, MONTANA, WITH SPECIAL REFERENCE TO CERTAIN ENTOMOLOGICAL ASPECTS. Wasmann J. Biol. 15(1): 123-151, 5 photos. Spring 1957.

A readable description of the park and its major ecological zones, with mention of many kinds of plants and animals.

Linsdale, Jean M. (Hastings Reservation, Jamesburg Rt., Carmel Valley, Calif.) ECOLOGICAL NICHES FOR WARM-BLOODED VERTEBRATE ANIMALS. Wasmann J. Biol. 15(1): 107-122. Spring 1957.

"Niche" is defined as the part of the habitat that is necessary for survival of an individual or its species. Importance to animals of niches and recognition of niches is discussed. The bulk of the paper consists of descriptions of habitat factors that have been found especially important to Citellus beecheyi, Neotoma fuscipes, Perognathus californicus, Odocoileus hemionus, and Pica nuttallii at the Hastings Reservation.

Reed, Edward B. (U. Sask., Saskatoon.) NOTES ON SOME BIRDS AND MAMMALS OF THE COLVILLE RIVER, ALASKA. Can. Field-Nat. 70(3): 130-136, 1 map. July-Sept. 1956 [1957].

Annotated list of 48 species of birds and 11 of mammals.

Scott, Walter E., committee chairman. (Wis. Cons. Dept.) THE WILDLIFE RESOURCE OF WISCONSIN. p. 27-42 in The Natural Resources of Wisconsin, publ. by State of Wis. Dec. 1956. 75¢ from Bur. Purchases, State Capitol, Madison 1., Wis.

A concise, popular picture of history, status, biology, and management of the more important birds, mammals, and fishes. History of Wis. wildlife is outlined, introductions and their results are tabulated, the "pyramid of numbers" is explained, and a few examples of migration and fluctuation are presented. Then follows a section in which some important birds and mammals are treated briefly but to the point with sketch of animal, map of instate distribution, and data on habitat, populations, value, and management. Similar data, but in text form, are given for various fishes. The paper closes with a little information on the growing human pressure on wildlife resources, and discussion of land-use practices that are favorable or unfavorable to wildlife.

Smith, Philip W. (Ill. Nat. Hist. Surv., Urbana.) AN ANALYSIS OF POST-WISCONSIN BIOGEOGRAPHY OF THE PRAIRIE PENINSULA REGION BASED ON DISTRIBUTIONAL PHENOMENA AMONG TERRESTRIAL VERTEBRATE POPULATIONS. Ecology 38(2): 205-218, 46 maps. Apr. 1957.

Valuable analysis of present ranges of amphibians, reptiles and some small mammals of e. Am. in relation to changes since last glaciation. A useful series of range maps, and information on climatic and vegetational changes since retreat of glaciers, are basis of discussions that interpret both the changes and the ranges.

Tischler, Wolfgang. SYNÖKOLOGIE DER LANDTIERE. Gustav Fischer Verlag (Stuttgart). xvi + 414 p., 116 figs. 1955. 36 DM. [From reviews by Amyan Macfadyen, Nature 179(4559) and J. Anim. Ecol. 26(1).]

In German. A text and reference on ecology of terrestrial animals. It is outstanding in that it goes a long way toward bridging the gap between Anglo-American and Continental approaches to ecology. The book provides a balanced appraisal of British and American work and the way it relates to the practical approach now prevalent in Germany. It is exceptionally free of jargon and has many useful text figures that summarize data of other authors. The first half is concerned with principles of synecology; it successfully welds together such subjects as population fluctuations, succession, biocenotic classifications, life forms, and ecology of man-made habitats. The second half treats 8 major vegetation types, including shore, rain forest, conifer forest, desert, and their variants. Discussion follows such headings as Living Conditions, Structure, Food, Biotic Relationships, and Over-wintering. There is also a section on land-types that result from human activity: Buildings, Gardens, Ruins, Arable and Pasture Fields, and Hedges. A final chapter is an appeal for enlightened land management and nature conservation.

Woodbury, Angus M. COMFORT FOR SURVIVAL. Vantage Press, 120 W. 31st St., N. Y. 1, N. Y. 104 p., illus. 1957. $3.00. [From review in Outdoors News Bul. 11(13).]

"Woodbury's book should be of interest to all persons interested in the behavior and characteristics of plants and animals. In it is introduced a thesis that 'comfort' and its attainment--at least most successfully--may account for the survival of some animal and plant forms where others perish. 'Thus, it appears,' the author writes, 'that those animals that can achieve necessary comforts without undue expenditure of energy are much more likely to survive in the struggle for existence than those which cannot achieve the necessary comforts, and are being continually driven to seek them and thereby drain their energy faster than it is replenished. Such animals have two possibilities: adapt or perish. Further, it seems that the quest for comfort is an evanescent thing. It is the quest that is important and the goal must be reached, but once achieved, a new goal is set, because of either a change in environment or a change in physiology that stimulate new requests.'"

WILDLIFE--NATURAL AREAS & REFUGES

Anon. PUBLIC USE OF NATIONAL WILDLIFE REFUGES - 1956. US F&WS, Wildl. Leafl. 383. 4 p. May 1957.

Visitor-days of hunting, fishing, and miscellaneous use are tabulated for each refuge. Grand total: 7,555,334 days.

McIntosh, Robert Woodrow. WILDLAND PLANNING PROCEDURES WITH EMPHASIS ON RECREATIONAL LAND USE IN THE TAHQUAMENON-PICTURED ROCKS REGION, UPPER PENINSULA OF MICHIGAN. Ph.D. thesis, U. Mich. 228 p. 1956. [From long abstract in Dissertation Abstracts 17(1).]

Newhall, Nancy. A CONTRIBUTION TO THE HERITAGE OF EVERY AMERICAN: THE CONSERVATION ACTIVITIES OF JOHN D. ROCKEFELLER, JR. With prologue by Fairfield Osborn and epilogue by H. M. Albright. Alfred A. Knopf, N. Y. 179 p., 223 photos (31 in color), 12 maps in color. 1957. $13.50. [From long review by Howard Zahniser, Nature Mag. 50(6).]

A "magnificently manufactured and beautifully designed testimonial volume" on the work of one of the world's leading conservationists of natural areas. Rockefeller's restoration of Williamsburg is famous, but few people realize that he poured many millions into acquiring and preserving for the public all or large areas of Great Smoky Mountains National Park, Shenandoah National Park, Grand Teton National Park, Yosemite, Acadia National Park, Virgin Islands National Park, the Redwoods, the Palisades of the Hudson, 5 other areas in the Hudson Valley, and Forest Hill Park at Cleveland. The text "is concise and, scattered through the volume, deals as much with photographs that comprise most of the description and interpretation of the sites of the Rockefeller generosity as with accounts of the contributions. The photographs are all superb." To

quote a New York Times editorial reprinted in the volume, "As our urban, mechanized society spreads itself with increasing speed and destructiveness across the land, the human need for preserving contact with natural areas, with living, wild and growing things, becomes more explicit and more pervasive. As natural areas rapidly diminish, the battle to keep the best of the remaining ones intact grows more intense."

WILDLIFE--NATURE PROTECTION & RARE & EXTINCT SPECIES

Steirly, C. C. (Va. Div. Forestry, Waverly, Va.) NESTING ECOLOGY OF THE RED-COCKADED WOODPECKER IN VIRGINIA. Raven 28(3/4): 24-36, 1 map. Mar.-Apr. 1957.

The red-cockaded woodpecker is doomed to go the way of the ivory-billed woodpecker. It lives only in old southern pines that are diseased with red heart. Good forestry practice cannot permit pines to reach this age and condition. Suitable habitat is already scarce and soon will be virtually non-existent. The bird does some harm to trees it uses, but since the trees are already diseased and the bird is scarce, the harm is of little importance. The paper gives a fine account of these situations and also gives much data on distribution and nest sites in Va. [It is interesting to realize that even special habitat preservation would do this species little good unless extreme and costly effort were made to manipulate succession to suppress hardwood growth and keep a constant supply of old pines coming along.]

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Buckley, Eleanor E., and Nandor Porges, editors. VENOMS. Am. Assn. Adv. Sci., 1515 Mass. Ave., Wash. 5, D. C. 480 p., 113 illus. 1956. $9.50 ($8.25 to AAAS members). [From review in A.I.B.S. Bul. 7(3).]

"It is difficult to imagine a more comprehensive treatment of the subject of animal venoms. Just as the lower animals which possess mechanisms for secretion and ejection of toxic substances are worldwide in distribution, the contributors to this symposium were international. Since numerous scientific disciplines are involved in solving the problems of the fields, the contributors are drawn from many areas of science. Sixty-one individual papers are included. Particular poisonous culprits discussed are: poisonous fishes, stingrays, gila monsters, toads, spiders including the Black Widow, caterpillars, insects, scorpions, and snakes, including cobras, rattlesnakes, and vipers. Subjects range from 'Cardiovascular Effects of the Venom of the Round Stingray Urobatis halleri,' through 'Anticoagulating Action of Cobra Venom' and 'The Hyaluronidase Content of Animal Venoms' to 'Snakebite in India.' An interesting historical chapter, 'Development of Knowledge about Venoms' by Chauncey Leake introduces the volume."

Carthy, J. D. ANIMAL NAVIGATION. Charles Scribner's Sons, 597 5th Ave., N. Y. 17, N. Y. 151 p., 195 illus. 1957. $3.95. [From review by L. R. Aronson, Nat. Hist. 61(4).]

"...we now know quite a bit about orientation and navigation in animals. This knowledge is presented by Dr. Carthy in an orderly manner. He sets down the facts in clear, simplified form, yet without sacrificing scientific accuracy. Ultimately, he believes, all animal navigation will be explained in terms of the senses already known to man. But certain of these senses may be far superior in many animals... For those who are interested in the current scientific theories concerning the methods by which animals find their way about the world, this small book is highly recommended reading."

Hine, Ruth L., and Kenneth G. Flakas. (Wis. Cons. Dept.) STRESS RESPONSE AND SURVIVAL TIME IN THREE WILDLIFE SPECIES. J. Wildl. Mgt. 21(2): 239-240. Apr. 1957.

Groups of Hungarian partridges, chukar partridges, and cottontail rabbits were subjected to stress of caging and starvation for periods of 10-12 days. Results showed amount of weight lost and survival time of these species, and thus indicated their resistance to applied stress. A few general inferences were drawn showing the use of such data in interpreting wildlife population behavior.—Ruth L. Hine.

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Cottam, Clarence. (Welder Wildl. Found., Sinton, Texas.) WILDLIFE AND CHEMICALS. Texas Game & Fish 15(6): 4-6, 26, 3 photos. June 1957.
General discussion of effects of insecticides and herbicides on wildlife, with several specific examples.

Springer, Paul F. (Patuxent Refuge, Laurel, Md.) EFFECTS OF HERBICIDES, FUNGICIDES ON WILDLIFE. Pages 87-106 in 1957 North Carolina Pesticide Manual. N. C. State Coll. 130 p. Jan. 1957.
Discusses toxicity and repellency of herbicides and fungicides to terrestrial and aquatic wildlife and effects of these chemicals on wildlife habitats. Many chemicals and chemical groups are considered individually. In general, their effects on terrestrial animals are not great if the chemicals are used properly. An appendix gives tabular data on acute oral toxicity of herbicides and fungicides to laboratory rats. Bibliography of 4 p.

Steele, John L. (Okla. Game Dept.) WILDLIFE AND THE BIG BLIZZARD. Okla. Game & Fish News 13(6): 14-15, 3 photos. June 1957.
The blizzard of Mar. 22-24, 1957, was a killer in w. Okla. Jackrabbits froze to death by the thousands. Wildlife losses were lower in rough areas than on open, windswept ranges. Perhaps 80-100% of scaled quail were wiped out on open ranges. Brush piles saved some of these quail; corrals were snow-traps. As a result of the storm, various coveys declined from 300 to 7, 300 to 35, 69 to 10, 265 to 30, 70 to 0, 45 to 2, 50 to 15, 35 to 1. Turkeys and antelope survived the storm with few losses. Pheasants suffered some losses but populations were not lowered to an obvious extent. Losses of prairie chickens were not determined, but at least some of these birds survived. Livestock losses were tremendous. A photo shows horses and cows being buried in a bulldozed trench.

WILDLIFE--PARASITES & DISEASES

Maddy, Keith T. (US Pub. Health Serv., Communicable Dis. Center, Atlanta, Ga.) ECOLOGICAL FACTORS OF THE GEOGRAPHIC DISTRIBUTION OF COCCIDIOIDES IMMITIS. J. Am. Vet. Med. Assn. 130(11): 475-476, 1 map. June 1, 1957.
Notes on ecology and life history of this fungus of the Lower Sonoran Life Zone, with special reference to occurrence around rodent burrows and pathology in dogs. The fungus attacks man and various animals. (A fuller version of this paper will be published by the Public Health Service in the proceedings of a symposium on Coccidioidomycosis.)

Rausch, Robert. (Arctic Health Res. Lab., Anchorage, Alaska.) ANIMAL-BORNE DISEASES IN ALASKA AND THEIR PUBLIC HEALTH SIGNIFICANCE. Proc. XVth Internatl. Vet. Cong. 8: 254-259. 1954. [From J. Mamm. 38(2).]

WILDLIFE--POPULATIONS & FLUCTUATIONS

Bartlett, M. S. (U. Manchester, Eng.) ON THEORETICAL MODELS FOR COMPETITIVE AND PREDATORY BIOLOGICAL SYSTEMS. Biometrika 44(1/2): 27-42. June 1957.
"One aim of the ensuing discussion is to indicate the enhanced value of deterministic formulations of population dynamics when properly interpreted within more comprehensive stochastic models. After some remarks on the logistic model of population growth for a single species, two problems are referred to: (i) the classical Lotka-Volterra predator prey relation, (ii) competition between two species, with special reference to the competition between the two species of flour-beetle, Tribolium confusum and Tribolium castaneum, as investigated by Park."--V. Schultz.

Lauckhart, J. Burton. (Wash. State Game Dept.) ANIMAL CYCLES AND FOOD. J. Wildl. Mgt. 21(2): 230-234. Apr. 1957.
Some rodent fluctuations apparently can be accounted for by population build-up, food depletion, starvation, crash, and recovery of food base. Lauckhart argues, however, that malnutrition from use of poor foods is commoner than outright starvation. Malnutrition may lead to disease, low reproduction, and less survival of young, all of which appear in cyclic declines. There is

evidence that buds and twigs of northern trees, the food supply of various herbivores such as grouse, are very low in nutrients, so that a slight change could cause malnutrition. A cyclic change that is known to affect northern trees is the seed cycle. It seems that trees in the North must store food for an av. of about 3.5 years before they can produce a seed crop. In this period their twigs and buds apparently become more nutritious, but become suddenly less so after seed formation. This may explain cycles of bud and twig eaters, and why these animals do not peak the same years as seed eaters. Interacting seed cycles could cause longer animal cycles. Weather could prevent a seed crop in any one year and thus lengthen a cycle.

Milne, A. (King's Coll., Newcastle upon Tyne, Eng.) THE NATURAL CONTROL OF INSECT POPULATIONS. Can. Ent. 89(5): 193-213, 2 diagrams. May 1957.

Milne discusses the ideas of Nicholson, Smith, Thompson, and Andrewartha and Birch on biological control, and points out weaknesses in all. "Taking the best out of these theories, and in the light of his own experience, the author puts forward the following theory: A perfectly density dependent factor or process will control increase of numbers endlessly. There is only one such in Nature for any species and that is competition between its own individuals. This is the ultimate controlling factor for increase. But in Nature, most species, in most places for most of the time, are held fluctuating at population levels where this kind of competition is relatively insignificant. That is, the ultimate controlling factor for increase is seldom invoked. The suggestion therefore must be that control of increase is, for most of the time if not almost endlessly, a matter of the combined action of factors which are density independent and factors which are imperfectly density dependent, each suppling the lack of the other. The ultimate control of decrease of numbers is brought about by density independent factors."

Steinhaus, E. A., editor. ANNUAL REVIEW OF ENTOMOLOGY. Vol. 1. x + 466 p., 7 pl., 2 figs. Annual Reviews Inc., Stanford, Calif. 1956. $7.50. [From review by G. C. Varley, J. Anim. Ecol. 26(1).]

Among the 21 review articles is one by W. R. Thompson entitled "The fundamental theory of natural and biological control." It is concerned mainly with comparing the views expressed by A. J. Nicholson (Outline of the dynamics of animal populations. Aust. J. Zool. 2: 1-65. 1954) and those expressed earlier by Thompson himself. There is agreement on a number of fundamental issues, but whereas Nicholson maintains that populations are self-governing systems, Thompson thinks they "are not truly regulated but merely vary, although indefinite increase is unlikely and in the long run will become impossible." "If an organism does not multiply without limit this is because it is restricted by its intrinsic specific limitations." Many workers will welcome this clear restatement of Thompson's views in relation to those of Nicholson.

Wellington, W. G. (For. Biol. Lab., Victoria, B. C.) INDIVIDUAL DIFFERENCES AS A FACTOR IN POPULATION DYNAMICS: THE DEVELOPMENT OF A PROBLEM. Can. J. Zool. 35(3): 293-323 + 9 pl. June 1957.

This paper on biology of tent caterpillars demonstrates that some individuals and colonies are active and some are sluggish, and that these traits are important in respect to extensions of infestations, age of infestations, feeding rates, and success of both individuals and colonies.

WILDLIFE—BIOMETRICS

Cole, LaMont C. (Cornell U.) THE MEASUREMENT OF PARTIAL INTERSPECIFIC ASSOCIATION. Ecology 38(2): 226-233, 1 fig. Apr. 1957.

Yapp, W. B. THE THEORY OF LINE TRANSECTS. Bird Study 3: 93-104. 1956. [From notice by L. McC., Ibis 99(1).]

"A mathematical formula for comparative determinations of the density of plants and/or animals."

WILDLIFE--TECHNIQUES

Choate, Grover A. (US For. Serv., Wash., D. C.) A SELECTED ANNOTATED BIBLIOGRAPHY OF AERIAL PHOTO INTERPRETATION KEYS TO FORESTS AND OTHER NATURAL VEGETATION. J. For. 55(7): 513-515. July 1957.

Cott, Hugh B. ZOOLOGICAL PHOTOGRAPHY IN PRACTICE / A CONTRIBUTION TO THE TECHNIQUE AND ART OF WILD ANIMAL PORTRAITURE. Fountain Press, London. 370 p., 68 pls. 1956. 52s. 6d. [From review by Colin G. Butler, Nature 179(4559).]

Dr. Cott is well qualified both as a biologist and as a photographer. His book is considered an excellent guide to zoological photography in the field. The first 6 chapters take up choice of camera, selection of film, use of filters, estimation of exposures, processing (including instructions for difficult field conditions in tropics), and printing and slide making. Two especially interesting chapters follow: one on the artistic approach to zoological photography, and the other, a particularly valuable one, on the scientific approach. The next 2 chapters give a fine introduction to photography of animals in such diverse surroundings as forest, sea-cliff, and desert. Tables and graphs are used extensively to illustrate various points. Also included are 68 art plates by author, bibliography of nearly 100 references, and index. Butler points out that a section on use of high-speed electronic flash should be included in any future edition.

Linehan, John T., and Leonard M. Llewellyn. AN IMPROVED BOX TRAP FOR SMALL GAME AND FUR ANIMALS. US F&WS, Leafl. WL 386. 1-4 p., illus. July 1957.

Describes an all-metal box trap that has aluminum frame and mesh body. This trap is superior to the commonly used wood-and-mesh trap in effectiveness, safety to animals, stacking qualities, and resistance to damage by animals. It can be constructed in almost any metal-working shop. The leaflet gives mechanical drawings, list of materials, and instructions for construction.

Riney, Thane. (N. Z. For. Serv., Wellington, N. Z.) THE USE OF FAECES COUNTS IN STUDIES OF SEVERAL FREE-RANGING MAMMALS IN NEW ZEALAND. N. Z. J. Sci. & Tech., Ser. B, 38(6): 507-532, 7 figs. May 1957.

Good paper with much useful information on value of pellet counts in determining relative or actual numbers of large animals on an area, seasonal variation in animal use of an area, population changes following hunting, habitat preferences, etc. Factors to be considered, such as aging of pellets, numbers of pellets produced, and disappearance of pellets, are discussed in detail. Examples are taken from Riney's work with game (chiefly ungulates) in N. Z. A number of important references on the subject are cited. Author's work involved "careful examination of mil-acre plots situated at regular intervals along lines in selected parts of the study environment. Results are expressed as number of defecations per hundred plots." Other observers were able to duplicate results to within 5%. "The use of short-term 10-station lines is described as a means of quickly obtaining objective information during rapid field surveys." Many suggestions are made on methodology and on the diverse uses to which pellet counts can be put.

Sampson, A. W., and Clark H. Gleason. (U. Calif., Berkeley.) CHANGE IN BURNING TERMINOLOGY. J. Range Mgt. 10(3): 103. May 1957.

Proposes definitions for: management burning, convenience burning, control-burning, and prescribed burning. Recommends that the term "controlled burn" be discarded and replaced by "control-burn."

Warham, John. THE TECHNIQUE OF PHOTOGRAPHING BIRDS. Focal Press, London & N. Y. 199 p., illus. 1956. $4.95.

An informative, practical book in which down-to-earth experience stands out in many places. Warham assumes that the reader has some photographic background and does not labor the general technicalities of the art. He does, however, start at the beginning in photography of birds. He discusses choice of equipment, gives innumerable suggestions for photographing birds at their nests, at bait, on the wing, and in a wide variety of sites. Use of bulb and electronic flash is considered at length. Special problems of photography and care of equipment and supplies in the tropics are treated practically and helpfully. In all, the book seems an excellent introduction to its specialized phase of photography. It has many excellent photographs of birds and several informative sketches demonstrating techniques.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Aldous, Shaler E., editor. SURVEY OF PITTMAN-ROBERTSON ACTIVITIES, 1956. US F&WS, Cir. 47. 1-182 p., proc. 1957.

Second volume of useful annual reference that succeeds P-R Quarterly. Every project of each state or territory is listed with statement of number, title, leader, and objectives. This occupies pages 3-106. The next section, Program Highlights, pages 107-124, summarizes the more interesting findings or results of many projects. It is arranged by subject for convenient reference. Pages 125-177 list publications that appeared during year and were based on PR work. Addresses of state and territorial fish and game departments are listed on pages 179-180. A subject index completes the volume. This series makes it quick and easy for anyone to find out just what is being done in PR work and to get in touch with personnel in charge of projects of interest.

Ball, Durwood E. (Soil Cons. Serv., Refugio, Texas.) OPERATION WILDLIFE. Soil Cons. 22(11): 243-245, 3 photos. June 1957.

How Matagorda Is., Texas, was improved by Air Force for hunting. The island is a bombing and gunnery range, 36 mi. long, and has poor soil and few trees. Cover, fresh water, and better food were needed badly. Better range management for livestock was instituted. Grapevines were planted along fences. Salt cedars were planted in 68 small fenced areas. Over 200 brush piles and other forms of cover were provided for quail and were quickly used. Twenty elevated turkey roosts were built with halves of oil drums on legs to keep land predators from climbing them. 220 acres were fenced and planted to ryegrass and oats; some will be planted to blue panicum, which provides food for many kinds of game. Strips were disked to encourage annual weeds. 27 freshwater ponds were created for waterfowl. Various introduced plants are being tried. Game has increased and is being harvested according to recommendations.

Galbreath, Donald S. (Wash. Dept. Game.) COLUMBIA BASIN WILDLIFE. Wash. State Game Bul. 8(4): 3-7, 15-16, 1 map, 3 photos, Oct. 1956. 9(1): 3, 6-7, 3 photos, Jan. 1957. 9(2): 4-5, Apr. 1957.

Long, detailed set of three articles on effect of irrigation developments on wildlife of a large area in Washington. In Part I, Galbreath shows that although some areas are now less productive of waterfowl, the overall effect has been to provide more food and more water. The result is more ducks and geese. Part II tells how rapidly pheasants moved in to the newly irrigated lands and increased there, and how they move on and off the area depending on seasonal cover conditions. This part also outlines briefly the probable effects of irrigation developments on other upland game species. Part III discusses the need of controlling deer of the irrigated area by suitable kills of antlerless deer, when and where needed. Too many deer were drowning in cement-lined canals whose walls sloped about 45°. This loss was nearly halved by "ramps" made by coating walls with mixture of asphalt and gravel up which deer can climb.

Jordahl, Harold C., Jr. (Wis. Cons. Dept.) FEDERAL AID...GIFTS...WILDLIFE. Wis. Cons. Bul. 22(7): 3-6, 1 photo. July 1957.

Since Wis. does not have enough state money to put up the 25% that is necessary to obtain all the PR funds to which it is entitled, the public is urged to donate funds that can be used for this purpose. Ten organizations have donated $1,850 to be used in this way for acquisition and development of Crex Meadows. The idea should have value for other states, particularly where highly popular projects are at stake.

WILDLIFE--HUNTING AREAS & PROBLEMS

Anon. SHOOTING PRESERVE / NILO FARMS DEMONSTRATION AND RESEARCH AREA. 2nd edition. Cons. Dept., Olin Mathieson Chem. Corp., E. Alton, Ill. 22 + 3 p., 4 figs. 1957.

Planning, planting, and operation of shooting preserves for pheasant and mallard hunting with special reference to Nilo Farms layout. Some of the methods, such as stopping strips and clump plantings, should be useful on any area managed for hunting farm game.

WILDLIFE--INTRODUCTIONS

Hobbs, D. F. DO NEWLY INTRODUCED SPECIES PRESENT A SEPARATE PROBLEM? Proc. N. Z. Ecol. Soc. no. 2. p. 12-14. 1955. [From Sport Fishery Abs. 2(2).]

"The author found little evidence in the literature to suggest that newly introduced species possess any special problems in population dynamics; little distinction is made between indigenous and introduced populations. It appears that there could be dangers in failing to appreciate certain differences which seem to warrant separate consideration of the dynamics of newly introduced populations. Some of the more important aspects are that extinction of indigenous species is rare while extinction of introduced species is common, that indigenous species have a relatively high population minimum in contrast to a usually very small initial population nucleus for exotic species, that indigenous populations confine population increases to relatively short periods while it is often protracted for introduced species, that fluctuations in a native population involve increases of a temporary nature while that for introduced species is often permanent involving extension of range, that the environment is conditioned by use of indigenous populations while it has yet to be conditioned by introduced species, and that natural enemies of indigenous species are present but natural enemies often arrive later for exotics. This points up the need for closer research interest in the dynamics of new populations."

WILDLIFE--ECONOMIC & OTHER VALUES

Bureau of Economic and Business Research, U. of Utah. A STUDY OF THE ECONOMIC VALUE OF FISHING AND HUNTING IN UTAH. Utah State Dept. Fish & Game, Publ. no. 7 of Fed. Aid Div. 1-73 p., 7 charts. 1957.

One of the more detailed reports of its type. It presents methodology as well as results and comparisons. In 1955, residents spent over $41 million for hunting and fishing and nonresidents spent $3 million in Utah. The total of $44 million is greater than the value of all farm crops of state, greater than value of cattle produced, greater than sales of furniture and appliance dealers combined, and much greater than value of sheep produced or drug store sales. 185,000 people hunted and/or fished. Those who fished spent av. of $93. Those who hunted spent av. of $105. Those who both fished and hunted spent av. of $335. Largest expenditure was for equipment, which comprised 40% of total cost. Transportation and food were next largest costs. Very few Utah business men failed to share some part of the sportsman's dollar.

California. POLL SHOWS HUNTING, ANGLING SPENDING IN STATE. Outdoor Calif. 18(4): 1, 3-5, graph. Apr. 1957.

Calif. conducted its own poll on sportsmen's expenditures in 1955. Hunters av. $265. Fishermen av. $218 for fresh water and $141 for salt water fishing. These figures are well above national av. Chief expenditures of hunters were for hunting equipment, transportation, food and drink, camping equipment, and dogs. The report gives many other data. In general, Californians spent 4 times as much for hunting and fishing as they did for admissions to football, basketball, and baseball games, movies, plays, and concerts combined.

Hatter, J. (B. C. Game Comm., Vancouver 1.) SURVEY OF EXPENDITURES BY HUNTERS IN BRITISH COLUMBIA, 1955. Can. Wildl. Serv., Wildl. Mgt. Papers Delivered at 20th Fed.-Prov. Wildl. Conf., 1956. p. 1-8. 1957.

Survey was made by mailed questionnaires. Av. expenditures worked out to $114 for holders of Resident Ordinary Firearms Licences, to $176 for holders of Resident Firearms Licences, and to $471 for nonresidents. Weighted av. for all resident hunters was $128. Estimated grand total was over $12 million, more than total value of wheat, oats, and barley crops, and almost as great as value of fruit crop. The $12 million is greater than the sales of all furniture and tobacco stores. Greatest hunter expenditures were for hunting equipment; miscellaneous items were second; transportation was third; accomodations and guide services were fourth. A companion paper, on p. 9-22 of same booklet, is Evaluation of the extent and economics of the British Columbia sport fishery in 1954, by S. B. Smith, of B. C. Game Comm.

WILDLIFE--FOOD HABITS & TECHNIQUES

McClure, David S. (Iowa State Coll.) SEED CHARACTERS OF SELECTED PLANT FAMILIES. Iowa State Coll. J. Sci. 31(4): 649-682, 5 pl. May 1957.

Seed characteristics of the following plant families are summarized: Araceae, Commelinaceae, Juncaceae, Iridaceae, Orchidaceae, Ulmaceae, Moraceae, Cannabinaceae, Urticaceae, Phytolaccaceae, Arizoaceae, Portulacaceae, Ranunculaceae, Papaveraceae, Fumariaceae, Capparidaceae, Saxifragaceae, Geraniaceae, Hypericaceae, and Violaceae. External characteristics as well as gross internal morphology are characterized and representative types illustrated. Distinguishing characteristics are summarized in the key.--Author.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Anon. 1956 IOWA BOUNTY PAYMENTS. Iowa Cons. 16(5): 129, 134, 2 photos. May 1957.

Lists animals bountied in each county and amounts paid for each species. Bounties are paid from county treasuries. Species bountied in whole state are coyote, wildcat (none listed for 1956), pocket gopher, and fox. Counties may also bounty crow, woodchuck, rattlesnake, and starling. Total amount spent on bounties in Iowa in 1956 was $149,562. [It is interesting to think what this amount of money could have accomplished in, for example, conservation education, or through extension-trapper system.]

Einarsen, Arthur S. (Ore. State Coll.) DETERMINATION OF SOME PREDATOR SPECIES BY FIELD SIGNS. Ore. State Coll. Press, Ore. State Monog., Studies in Zool., no. 10. 1-34 p., 25 figs. Aug. 1956.

Interesting, worthwhile paper designed to aid in determining what animal made a kill or ate eggs. It presents information on killing and eating patterns of horned owl, sharp-shinned hawk, Cooper's hawk, red-tailed hawk, crows and jays, bald eagle, striped skunk, ground squirrel, house cat, and foxes. Author points out in introduction that predation usually has little importance to a game population, except where prey population is already in danger for other reasons. Sportsmen, exaggerating the predator threat and launching control campaigns, may do more damage (by entering game coverts during breeding and causing desertion) than do the predators. Author also points out that hen pheasants are much less skilled in self-protection than males, that red-tailed hawks kill much game, and that domestic dogs are more destructive than domestic cats in the areas studied.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Alabama. DEPARTMENT OF CONSERVATION...REPORT FOR FISCAL YEAR OCTOBER 1, 1955-SEPTEMBER 30, 1956. 1-205 p., illus. 1957?

Report of Div. of Game & Fish (p. 94-166) reports on animals stocked (including Coturnix), discusses status of major game species, and tells briefly what was done in studies of dove, deer, waterfowl, quail feeders, squirrel-hunting statistics, turkey weights, and use of food plots made for turkeys. It also summarizes results of the economic survey of hunting and fishing (see WR 88:12) and reports in detail on work done on farm, forest, and wetland management areas. The Coop. Wildl. Res. Unit summarizes studies of quail, burning for quail, deer, and trichomoniasis of doves.

Idaho. TWENTY-SIXTH BIENNIAL REPORT OF THE FISH AND GAME DEPARTMENT... JULY 1, 1954 TO JUNE 30, 1956. 71 p., illus. 1957?

Provides data on status and kill of each type of big game and on transplanting of deer. Studies of big game ranges and work toward range rehabilitation are described. Pheasant sex-ratio counts and hunting statistics are tabulated for the biennium. Status and hunting results are discussed for other upland game birds. Results of winter inventories of waterfowl are presented for 1952-56. Habitat improvement work on management areas and elsewhere is reviewed. Game farm production is tabulated. Catch of fur animals is listed by species for the biennium. Costs and results of predator control activities are stated. PR projects, and projects of Coop. Wildl. Res. Unit, are listed.

Idaho. SUMMARY OF OPERATIONS 1956. Idaho Department of Fish and Game. iv + 44 p., proc. 1957.
Contains very much the same sort of information described for the biennial report except that statistics for special hunts are reported in detail.

Kansas. FORESTRY, FISH AND GAME COMMISSION, SIXTEENTH BIENNIAL REPORT, JUNE 30, 1956. 1-79 p., illus. 1957?
This account of activities in the fiscal years 1955 and 1956 includes information on status of small game species, figures on game-farm production of quail and pheasant, brief discussions of PR projects, and a record of work done and policies adopted in providing planting stock for farm habitat.

KENYA WILD LIFE SOCIETY. FIRST ANNUAL REPORT 1956. Kenya Wild Life Soc., P. O. Box 20110, Nairobi, Kenya. 66 p., illus. 1957. 3s.
This society was organized to combat the rapid destruction of Kenya's important big game herds. One of the world's finest and most spectacular wildlife resources is being lost with ever-increasing speed. A major problem is wholesale, commercial poaching by Africans. The enormous volume and wastefulness of this traffic is amazing. Another major problem is the national parks. Their status is extremely unsatisfactory, for some are heavily used by livestock belonging to natives who have full legal right to graze the parks. Vital waterholes may be fenced to exclude game. Extensive poaching occurs in the parks. Game that leaves parks to find food and water may be slaughtered mercilessly. Solutions to these problems are not simple legally, economically, or anthropologically. Police efforts, at least, have been stepped up. Wildlife management in the American sense seems far in the future. The present fight is for simple preservation, and for places where animals can exist. Birds, in general, have not declined greatly, but waterfowl are in real danger. Major marshes have been drained for agriculture. Few good waterfowl areas remain and populations are seriously reduced. Sanctuaries and hunting restrictions of types used in America are proposed. The Kenya Wild Life Society is working against terrific odds and is making a fight that is of concern to conservationists of the whole world. Financial and moral support from conservationists in all countries is urgently requested.

Michigan. EIGHTEENTH BIENNIAL REPORT, 1955-1956, THE DEPARTMENT OF CONSERVATION. 231 p., illus. 1957?
Report of Game Division is too long (p. 125-168) and informative for all points to be mentioned. It summarizes work done in game districts; tabulates land acquisitions; lists PR projects; and tells what was done in habitat improvement on farms, game and recreational areas, and for waterfowl and furbearers. Herbicides were used in several ways to alter habitats. Numerous small impoundments were created. Research at 4 experiment stations is reviewed. Among other things, it was found that brush piles could increase cottontail kill as much as 300% where cover was scarce. Malnutrition of does was found to have several ill effects on fawns. Woodcock were found to be underharvested; earlier season is needed. Woodcock feeding grounds received heavier use after herbicide treatment. Status and kills of game species is discussed in detail. Pheasants were still high and on uptrend; kill was second only to that in S. Dak. A cold, wet period in Apr.-May of 1956 reduced pheasant production of that year. Ruffed grouse were at cyclic low. More evidence is presented on the futility of closing grouse season during lows. Prairie chickens declined; they persist in few areas. Sharptails declined; their habitat is lessening despite clearings on public lands, and hunting may be too heavy. Data are given on kills and seasonal populations of waterfowl. Snowshoe hares were at cyclic low. Squirrel populations remained good despite mast failure. Deer kill is tabulated. Deer suffered heavy losses in winter of 1955-56. Authority was given for special hunts in areas of deer-food shortage or crop damage. Bear kills were estimated at 1190 and 620. Bobcat was made game animal in Lower Peninsula. Fur catch is tabulated by species, 1950-56. Otter catch doubled in this period owing to fur price and trapper interest. Latest introductions of Hungarian partridge seem successful. Turkeys released seem to be surviving and reproducing reasonably well. Ptarmigan release of 1949 is deemed a failure.

Myers, Robert H., and Robert L. Kessler. (Ky. Dept. Wildl. Resources.) GAME POPULATIONS REMAINED HIGH IN 1956-57 SEASONS. Ky. Happy Hunting Ground 13(3): 12, 32, 1 photo. May 1957.
Hunting statistics for species or groups of game in Ky., 1956-57 season.

Nevada. REPORT OF THE FISH AND GAME COMMISSION FOR THE PERIOD JULY 1, 1954, TO JUNE 30, 1956, INCLUSIVE. 1-71 p., illus. 1956.
Much of this report is devoted to accounts of game conditions and work done in the several supervisory districts of the Comm. Also, PR research and development projects are discussed briefly. Kills of major types of game are tabulated for 1954 and 1955. Beaver catches of the biennium are listed.

New Jersey. ANNUAL REPORT...DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT, DIVISION OF FISH AND GAME, FOR THE FISCAL YEAR COMMENCING JULY 1, 1955 AND ENDING JUNE 30, 1956. 1-45 p. [1957.]
The section on wildlife (p. 25-30) reports that the number of hunters decreased, but not use of public shooting grounds. Figures are given on estimated kills of various types of game as compared to year before. Kills of rabbit, squirrel and "duck" were down by 14%, 4.5%, and 6.2%. Kill of pheasant was up by 31%. Notes are given on status and use of public shooting grounds. Research projects are listed, with brief notes for some. Work done in farm habitat restoration is reviewed concisely, as is work done in deer control. Deer kill is tabulated by counties. Numbers of pheasants and quail reared and released are tabulated.

Nova Scotia. REPORT OF THE DEPARTMENT OF LANDS AND FORESTS, FISCAL YEAR ENDING MARCH 31, 1956. Queen's Printer, Halifax. 1-62 p., illus. + folding tables. 1956 [1957].
The section on wildlife (p. 45-58) presents data on: kill of moose, 1908-37, and present status of moose; kill of deer, 1916-55, present status of deer herds in relation to range, and age groups of deer bagged; pheasants released and pheasants shot; status of snowshoe hare; status of ruffed grouse; numbers of bears bountied, 1942-55; catch of beaver; numbers of furs of various species exported from province; and status of different game animals in provincial sanctuaries. Moose are increasing steadily. Moose sickness has declined. This ailment often is accompanied by brain abnormality of unknown cause. Kill of deer dropped about 3,000 in 1955 as number of deer hunters dropped about 5,000. Deer seem to have higher production every second year. Deer kill rose from 69 in 1918 to 43,400 in 1955. Both sexes of deer are hunted. 1,914 pheasants were released; 3,128 were shot. Snowshoe hares were increasing. Ruffed grouse populations varied in status, with decline on Cape Breton Island. Numbers of bears bountied were 132 in 1942 and 172 in 1955, with high of 409 in 1947--a long-term fluctuation may be suspected.

Oklahoma. BIENNIAL REPORT OF THE OKLAHOMA GAME AND FISH DEPARTMENT FOR THE BIENNIUM JULY 1, 1954--JUNE 30, 1956. 49 p., illus. 1957?
A descriptive and fiscal report. Includes data on game-farm quail and pheasants stocked, list of PR projects, list of Coop. Wildl. Res. Unit projects, and list of lands controlled by department.

Phelps, Chester F. (Va. Comm. Game.) VIRGINIA'S DEER, BEAR AND TURKEY KILL FOR 1956-57. Va. Wildl. 18(5): 20. May 1957.
Figures are given, by county, for kills of 3 hunting seasons, 1954-55, 1955-56, and 1956-57. Deer killed totaled 14,163, 14,227, and 20,859. Bears killed totaled 270, 156, and 135. Turkeys killed totaled 2,082, 2,797, and 2,470. The decline in numbers of bears bagged has caused the bear to receive special attention from game biologists.

Saskatchewan. ANNUAL REPORT OF THE DEPARTMENT OF NATURAL RESOURCES FOR THE FISCAL YEAR ENDED MARCH 31, 1956. xii + 124 p., illus. 1957.
The report of the Game Branch, p. 21-43, contains much useful information. Status of all important types of game is discussed and data on hunting results are given. Research projects are described briefly. Wolf and coyote control is summarized. Coyotes were reduced to low levels in many areas. Moose and elk were increasing rapidly. Woodland caribou were increasing well enough that

an open season was in prospect. Barren ground caribou were down sharply. Tularemia in beaver was confirmed. A muskrat die-off in s. Sask. was associated with disease and malnutrition. The waterfowl breeding season was highly successful and the bag limit was increased. An exceptionally hard winter affected several types of game, but apparently had no serious population effects. Tables show reported kills of game birds and big game, by species, and numbers and values of wild fur animals taken, by species. Graphs show take and value, for the years 1946-56, of fisher, muskrat, beaver, squirrel, mink, weasel, lynx, otter, marten, fox, coyote, and wolverine.

Texas. ANNUAL REPORT OF THE GAME AND FISH COMMISSION...FOR THE FISCAL YEAR 1955-1956. 1-80 p. 1957?

The report begins with summary of economic survey for 1955 made by Crossley, S-D Surveys. 41% of households had at least 1 fisherman or hunter. Av. expenditure was $87 per fisherman and $59 per hunter. Total spent for hunting was $42,135,000; total for both hunting and fishing was $165,054,000. Next section of the report describes the many PR projects in fair detail. Another section describes 3 research projects handled cooperatively with Texas A & M Coll. Tables report on land acquisitions and on game transplanted.

VERMONT FISH AND GAME SERVICE BIENNIAL REPORT 1955-1956. 1-64 p., illus. 1957?

Breeding woodcock of the NE. declined in numbers; if the decline continues, regulatory reduction in kill will be needed. Numerical results of study of black duck nesting are presented in table. Nesting of black ducks was increased several fold by placing piles of cedar brush on barren islands. Population trends of ruffed grouse are tabulated for each year, 1939-55. Good tabular data are given on weights and ages of deer bagged, 1947-55, and on numbers of deer killed in the biennium. Figures are also provided on deer damage claims paid, bear damage claims paid, bobcats bountied, beaver trapped, and on estimated catches of other fur animals (by species). Acquisition and management of waterfowl areas are discussed briefly, area by area. PR projects are listed.

WETLANDS & WILDLIFE

Blum, John L. (Canisius Coll., Buffalo, N. Y.) THE ECOLOGY OF RIVER ALGAE. Bot. Rev. 22(5): 291-341. May 1956.--Neil Hotchkiss.

Drury, Wm. H., Jr. BOG FLATS AND PHYSIOGRAPHIC PROCESSES IN THE UPPER KUSKOKWIM RIVER REGION, ALASKA. Harvard U., Contrib. Gray Herb. 178. 130 p., illus. 1956.

Chiefly on ecology and origin of the bogs.--Neil Hotchkiss.

Gilchrist, Charles P., Jr. (Va. Comm. Game.) IS YOUR MARSH ATTRACTIVE TO WATERFOWL? Va. Wildl. 18(6): 16-22, 4 pl., 1 photo. June 1957.

Text gives general advice on improving marshes in Va. for waterfowl by bettering food conditions. Table lists desirable and undesirable plants for different types of marshes in Va. Plates contain drawings of desirable and undesirable types of plants. These plates are from a paper by W. P. Baldwin (see WR 84: 38).

Lynch, R. G. DRAINAGE VERSUS DUCKS. Am. For. 63(2): 22-23, 58-59, 61, 2 photos. Feb. 1957.

Story of the present controversy over marsh and pothole drainage. Viewpoints of Soil Cons. Serv., farmers, and wildlife workers are presented fairly.

Philen, E. A., and G. T. Carmichael. (Fla. State Bd. Health, Jacksonville.) THE MANAGEMENT OF WATER FOR MOSQUITO CONTROL IN THE COASTAL MARSHES OF FLORIDA. Mosquito News 16(2): 126-129. June 1956.

Control of salt-marsh mosquitoes and sand flies apparently can best be achieved through diking and flooding. Dikes were made by placing sand and mud directly on the marsh vegetation. This was successful and resulted in marked savings. The areas were flooded to a depth of about 1 foot in May. A high population of minnows was present, and if any egg laying by mosquitoes occurred,

the larvae apparently failed to reach maturity. It was concluded that this method offered possibilities for rapid control of both mosquitoes and sand flies at far less cost than ditching or filling. This would be true unless extensive pumping were required to maintain water levels. Pumping would be unnecessary in many sites. Diked but unflooded areas had little mosquito breeding, largely because tidal flooding was excluded, and because pools in unflooded areas had good minnow populations. Early indications are that dikes may not be needed on landward sides of marshes.

Prescott, G. W. (Mich. State U.) A GUIDE TO THE LITERATURE ON ECOLOGY AND LIFE HISTORIES OF THE ALGAE. Bot. Rev. 22(3): 167-240. Mar. 1956.--Neil Hotchkiss.

Seidel, Käthe. DIE FLECHTBINSE (SCIRPUS LACUSTRIS L.). Vol. XXI of Die Binnengewässer. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart. xv + 216 p., illus. 1955. DM 36.00, paper. [From long review by Hugh H. Iltis, Sci. Monthly 84(5).]

In German. "...intended to be a comprehensive monograph on the 'ecology, morphology and development, ethnological position, and economic importance' of Scirpus lacustris, one of the bullrushes, closely related to our American Scirpus validus. The author...has worked for more than 17 years with this plant, first as a person interested in the artistic articles made from this Flechtbinse (weavers' rush), later as a botanist. The monograph is divided into three divisions: (i) the plant in fresh water; (ii) the plant in brackish and salt water; and (iii) the uses and the history of the species with respect to man." Iltis considers the author's taxonomy somewhat naive and the book in general rather repetitious. The book does, however, contain a great deal of good information on ecology and economic value of the plant.

Stoddard, Charles H. (Resources for the Future, 1145 19th St. NW., Wash. 6, D. C.) UTILIZATION OF SWAMPLANDS FOR WILD RICE PRODUCTION: A PROGRESS REPORT. J. Soil & Water Cons. 12(3): 135-138, 5 photos. May 1957.

Summary: "In northwestern Wisconsin, a 20-acre area was dammed, burned, disked, flooded, and seeded to wild rice at a direct cost of approximately $100 per acre. The first-year yields of wild rice were considerably reduced by blackbirds, but the birds were finally repelled with metallic streamers. Waterfowl were attracted to the area, and management of exploitable fish and furbearer populations seems possible. Caution is urged in making any introductions, especially if exotic species are considered. As a land-use technique potentially capable of paying for itself over an important part of the Lake states, this experiment points to a possible way for utilization of large areas of swampland. Specific research needs are presented."

White, Charles M., commission chairman. (State Bd. Health, Raleigh, N. C.) REPORT OF THE NORTH CAROLINA SALT MARSH MOSQUITO STUDY COMMISSION. Raleigh, N. C. iii + 101 p., illus. Jan. 1957.

The importance of considering wildlife values is brought out at many places in this report. Impoundments for mosquito control and wildlife benefits are given attention as one of the worthwhile techniques to be used. It is shown that such impoundments may strongly increase production of wildlife, and that income from game, furs, and seafood produced in impoundments may help defray costs of construction and maintenance. The report also points out that mosquitoes are produced on only about 5% of the salt-marsh area and that control work must be focused on this 5% if a 95% waste of time and money is to be avoided.

FARMLAND & WILDLIFE

Mansfield, E. Marvin. (Ohio Div. Wildl.) AN EVALUATION, AFTER SIX YEARS, OF WILDLIFE PLANTINGS IN OHIO. Ohio Div. Wildl., F. A. Proj. W-56-D-7. 1-12 p., proc. Mar. 1957.

About 60 farms that had been improved for wildlife in 1949-50 were studied in 1956 by interviews with farmers and inspection of plantings. Fifty farmers wanted more quail (which are protected in Ohio), 40 wanted more pheasants, and

FARMLAND & WILDLIFE--Continued

38 more rabbits. Hunting pressure, dreaded by many farmers, probably changed little in the 6 years. About half the farmers felt the plantings had caused increase of game. Half reported increase of pheasants, a third reported increase of quail and rabbits. Most were willing to accept more multiflora rose; about half would accept pines. Survival of rose was about 82%. In wildlife value, 45 rose plantings were rated good, 14 fair, 3 poor. As fences, 33 rose plantings were rated as reasonably good, 20 fair, 9 poor. Maack honeysuckle (Lonicera Maacki) was only other shrub that did well. Black locust did fairly well. Coralberry did fairly well in most plantings. Survival of white, red, and Scotch pines was mostly fair, sometimes poor. Poor survival was noted for black haw, wahoo, winterberry, red-osier dogwood, and black walnut. Of 323 acres of woodlot fenced, 280 acres were still effectively fenced. On the whole, continuation of projects on 85% of the farms would be recommended. Author suggests issuing fencing wire only to carefully selected individuals and where follow-up is possible. He also recommends issuing shrubs only for planting on good, well-prepared sites where plantings can be marked by stakes and will be fertilized and cultivated.

Quarterman, Elsie. (Vanderbilt U.) EARLY PLANT SUCCESSION ON ABANDONED CROPLAND IN THE CENTRAL BASIN OF TENNESSEE. Ecology 38(2): 300-309, 6 figs. Apr. 1957.
Fields studied had been abandoned from 1 to 25 years.

RANGELAND & WILDLIFE

Hubbard, Richard L. (Calif. For. & Range Exp. Sta., Berkeley.) THE EFFECTS OF PLANT COMPETITION ON THE GROWTH AND SURVIVAL OF BITTERBRUSH SEEDLINGS. J. Range Mgt. 10(3): 135-137, 3 figs. May 1957.
Seedlings were killed or greatly suppressed by heavy competition from other plants.

Humphrey, R. R., and R. J. Shaw. (U. Ariz.) PAVED DRAINAGE BASINS AS A SOURCE OF WATER FOR LIVESTOCK OR GAME. J. Range Mgt. 10(2): 59-62, 1 photo. Mar. 1957.
Summary: "A triangular area containing 4,300 square feet was paved with asphalt in a 14-inch rainfall zone in southern Arizona. Rainwater from this area has been stored in an adjacent cistern. As a source of water for livestock this type of construction appears to be feasible where other cheaper or more dependable sources of water are not available." Cistern has capacity of 29,700 gallons and has remained essentially full. Total cost of outfit was $2,027. Construction of runoff area is discussed. Table shows amounts of water stored per 1000 sq. ft. of runoff area with various amounts of precipitation. Another table shows cistern capacities required for livestock under different stocking conditions.

Moomaw, James Curtis. SOME EFFECTS OF GRAZING AND FIRE ON VEGETATION IN THE COLUMBIA BASIN REGION, WASHINGTON. Ph.D. thesis, State Coll. Wash. 94 p. 1957. [From long abstract in Dissertation Abstracts 17(4).]

FORESTLAND--FORESTRY & ECOLOGY

Barton, James Don. COMPARISON OF FOUR FOREST SAMPLING TECHNIQUES. Ph.D. thesis, Purdue U. 121 p. 1956. [From long abstract in Dissertation Abstracts 17(4).]
"The 4 methods, quadrats of 3 sizes (1/40 acre, 1/10 acre, and 1/5 acre), strips 602 x 25 feet, quadrants, and the variable-radius method were discussed in relation to 2 parameters, density per acre, and basal area per acre."

Boyce, John S., Jr. (SE. For. Exp. Sta., Asheville, N. C.) OAK WILT SPREAD AND DAMAGE IN THE SOUTHERN APPALACHIANS. J. For. 55(7): 499-505, 4 figs. July 1957.
Good paper on this disease; includes information on control.

Drake, Charles Roy. SPREAD AND CONTROL OF OAK WILT. Ph.D. thesis, U. Wis. 101 p. 1956. [From long abstract in Dissertation Abstracts 16(10).]

Reed, John C., Jr., and John C. Harms. (US Geol. Surv., Denver, Colo.) RATES OF TREE GROWTH AND FOREST SUCCESSION IN THE ANCHORAGE-MATANUSKA VALLEY AREA, ALASKA. Arctic 9(4): 238-248, 10 figs. 1956.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Baskett, Thomas S., Robert L. Dunkeson, and S. Clark Martin. (U. Mo.) RESPONSES OF FORAGE TO TIMBER STAND IMPROVEMENT IN THE MISSOURI OZARKS. J. Wildl. Mgt. 21(2): 121-126, 5 figs. Apr. 1957.

Summary: "Effects of release of browse, grasses, and forbs in a post oak-blackjack oak type having dense tree reproduction were studied quantitatively. Release was accomplished by girdling cull trees on a study area in the Missouri national forests, according to regular Forest Service procedure. Although a severe drouth affected results, tree reproduction and all classes of forage were much more abundant on released than on unreleased areas after five years. At the end of the study period, frequency of browse was 30 per cent greater in released than in unreleased strips; comparable figures for other classes of forage were: grasses and sedges, 72 per cent; and forbs, 35 per cent. Even in this post oak-blackjack oak stand with dense tree reproduction, standard silvicultural procedure favored production of forage. However, where forage release is a primary objective, cull trees with desirable forage plants and little tree reproduction under them might profitably be selected for girdling. If tree reproduction is abundant, selective application of herbicides may be desirable."

Haskell, Albert Russell. THE PHARMACOLOGY OF TETRAMINE (TETRAMETHYLENE-DISULFOTETRAMINE). Ph.D. thesis, U. Fla. 83 p. 1956. [From long abstract in Dissertation Abstracts 17(2).]

Extensive studies were made of mode of action of this rodent repellent and poison with aim of discovering antidote useful to control operators who deal with this deadly chemical. "It is concluded that the convulsive activity of Tetramine is located in the brain stem..." "Of the fourteen antidotes tested, Flexin, Milontin, Phemurone, and phenobarbital showed promise of sufficient activity to warrant further examination. Of these compounds, administered singly and in combination, phenobarbital alone demonstrated the ability to overcome the clonic spasms of Tetramine and prevent death of the animal without producing severe depression."

Hooven, Edward F. FIELD TEST OF TETRAMINE TREATED DOUGLAS FIR SEED. Ore. State Bd. For., Res. Note no. 29. 1-11 p., 5 photos. Nov. 1956.

Four areas were seeded, 2 with plain seed, 2 with tetramine-treated seed. Small mammals, especially Peromyscus maniculatus, were live trapped before and after seeding. Slight reductions of mammalian populations occurred in all 4 plots, probably because of natural causes. Many mice continued to live in treated areas. Ten months after broadcasting seed, stocking of seedlings was good on treated areas, poor on control areas. Apparently tetramine protects seeds effectively without serious effects on mammalian populations and without need of poisoned buffer areas.

Lavender, Denis P., and Wilbur H. Engstrom. VIABILITY OF SEEDS FROM SQUIRREL-CUT DOUGLAS FIR CONES. Ore. State Bd. For. (Salem), Res. Note no. 27. 1-19 p., 6 figs. Mar. 1956.

Experiments proved that cones collected from caches of Tamiasciurus are a good source of sound seed. Such cones are used as a cheap source of seed for reforestation.

Lay, Daniel W. (Texas Game Comm., Buna.) BROWSE QUALITY AND THE EFFECTS OF PRESCRIBED BURNING IN SOUTHERN PINE FORESTS. J. For. 55(5): 342-347. May 1957.

Analyses of 25 unburned browse species in e. Texas revealed that protein content was low in fall and winter and that phosphoric acid content was deficient in summer, fall, and winter. "Winter is the most critical dietary period

for game, and phosphoric acid is the most critical nutrient; yet, in winter in this region, levels of browse are above those of herbaceous forage, accounting in a logical way for the competition between cattle and deer for browse during the winter months. Burning increased protein content as much as 42.8 percent and phosphoric acid content as much as 77.8 percent in the species involved, but most of the benefits disappeared within a year or two. More permanent improvement in the quality of the fall and winter diet is needed... Increased production of palatable understory evergreens would give this effect, and probably represents the most practical means of attaining such improvement."

Mould, R. C. L. DESIGNING GAME COVERTS. Quart. J. For. 49(4): 281-286. 1955. [From J. Anim. Ecol. 26(1) and Biol. Abs. 31(5).]

Describes the general principles for the design of game coverts to serve also as commercial woods. A shooting model designed for pheasants is illustrated and described in some detail. Certain principles such as keeping woods quiet during nesting, and discontinuance of thinning during shooting periods are listed.--P. B. Dowden.

Reid, Vincent H., and Phil D. Goodrum. (US F&WS, Fort Collins, Colo.) FACTORS INFLUENCING THE YIELD AND WILDLIFE USE OF ACORNS. Presented at Sixth Annual La. State U. For. Symposium, Baton Rouge, La. 43 p., 7 figs., mimeo. Apr. 1957.

During a 6-year study in La. and Texas, the authors found considerable variation in numbers and sizes of acorns produced by each of 7 spp. of oaks and by individuals of each sp.; also in the rate of production from year to year. They relate production to boll and crown diameter, age of tree, density of forest stand, and to time of late frosts. Data are given on weight and number of acorns produced and on expected yield. Use and needs of acorns by various forms of wildlife are analyzed.--Clark G. Webster.

Roy, D. F. (Calif. For. & Range Exp. Sta., Berkeley.) SEED SPOT TESTS WITH TETRAMINE-TREATED SEED IN NORTHERN CALIFORNIA. J. For. 55(6): 442-445, 2 graphs. June 1957.

The standard acetone-tetramine treatment did not inhibit germination of ponderosa pine seed, but it did inhibit and retard germination of Douglas-fir seed. This treatment protected conifer seed from rodent attack. Dextrin-tetramine treatment did not protect conifer seed from rodents. It did, however, inhibit germination of ponderosa pine seed. Seedlings grown from tetramine-treated seed were not protected from rodents and insects.

Sharp, Ward M. (Pa. State U.) MANAGEMENT OF A POLETIMBER FOREST FOR WILDLIFE FOOD AND COVER. Pa. State U., Agr. Exp. Sta., Bul. 620. 1-26 p., 7 figs. June 1957.

Sapling and poletimber forests are virtually deserts insofar as game is concerned. Yet stands of this type make up 74.5% of Pennsylvania's forest. Experimental wildlife management was tested 1950-57 in the Centre County Barrens. It produced results on which recommendations may be based. Half of a tract of 1,470 acres was improved by cutting and bulldozing areas, mostly 1/2 to 1 acre in size, with varying degrees of intensity. These areas were scattered over the tract. The plan was to create an av. of 15.5 openings each year over a 10-year period, thus providing all stages of regrowth. Only 10% of the area will have been cleared in the 10 years. Costs were about $15 per acre treated. Grouse responded well as determined from brood usage; in 2 good brood years, 87.5% of broods visited the managed half of the study area. Deer, cottontails, and turkeys derived as much benefit as grouse, with no species being particularly favored. [For longer abstract on this work, see WR 88: 69.]

Smith, Robert Leo. AN EVALUATION OF CONIFER PLANTATIONS AS WILDLIFE HABITAT. Ph.D. thesis, Cornell U. 245 p. 1956. [From long abstract in Dissertation Abstracts 17(3).]

60 conifer plantations of various types and ages were studied near Ithaca, N. Y. Birds, small mammals, and earthworms were sampled quantitatively. Data were also obtained on game animals. Conclusions: "The wildlife potential of conifer plantations depends on a great number of variables, including site, coniferous species, height, size, openings and management. Plantations over 10 acres have created favorable habitat for certain species of wildlife in areas

where no habitat for them existed before. In these, survival failures and cover interspersion provided by mixed stands have developed conditions favorable to many game and non-game species. The diameter of large plantations is of little significance as long as openings occur within them."

Tackle, David. (Intermtn. For. & Range Exp. Sta., Missoula, Mont.) PROTECTION OF PONDEROSA PINE CONES FROM CUTTING BY THE RED SQUIRREL. J. For. 55 (6): 446-447, 1 photo. June 1957.

Aluminum sheets were nailed to trees at height of 7 ft. from ground. Sheets 18 in. high kept red squirrels from climbing trees. Sheets of 6 in. and 12 in. did not. Branches of protected trees should be at least 7-8 ft. from branches of unprotected trees or squirrels can jump from one to the other. Growth of branches, of course, tends to reduce this distance. Studies on this point are needed, as are studies on improved substitutes for aluminum sheets, and on number of protected trees needed per acre for adequate seeding.

CONTROL OF UPLAND VEGETATION WITH HERBICIDES ETC.

Brender, E. V., and C. S. Hodges. HONEYSUCKLE OR TREES? US For. Serv., SE. For. Exp. Sta. (Asheville, N. C.), Res. Notes no. 103. 2 p. June 1957.

Japanese honeysuckle is a dominant plant from Md. to Ga. It has value as browse for cattle and deer, but it is a cause of difficulty in forestry [and it interferes with many wildlife plantings]. Thirteen herbicides were tried. None prevented resprouting. The 2 best treatments were: "1. Spray foliage with 4 gallons per acre of butoxy ethanol ester of 2,4-D and 2,4,5-T, 2:1 ratio, 2 pounds acid equivalent per gallon of concentrate (ACP-977 or its equivalent) in 250 gallons of water, early in the summer. Repeat treatment later in the summer when sprouting recurs, using a lower volume of the same concentration. 2. Spray foliage with 10 pounds per acre of 50 percent 3-amino-1,2,4-triazole wettable powder (Weedazol or its equivalent) in 125 gallons of water early in the summer. Repeat treatment later in the summer or the following spring when the foliage commences to turn green again, using a lower volume of the same concentration." Both treatments are costly. Small patches of honeysuckle can be controlled by mulching with a 2-inch layer of sawdust.

Sax, Karl. PASTE THE POISON IVY. Arnoldia 16(2): 5-8, illus. 1956. [From Biol. Abs. 31(2).]

Directions are given for an emulsion weed killer which can be applied directly to the stem or to an area from which the bark has been removed from poison ivy and other weed plants. It is effective if applied directly to the poison ivy so that the roots are penetrated. It does not injure adjacent valuable ornamental plants.--F. L. Barrows.

Worley, D. P., W. C. Bramble, and W. R. Byrnes. (Pa. State U.) INVESTIGATIONS OF THE USE OF 2,4,5-T ESTERS AS A BASAL SPRAY IN THE CONTROL OF BEAR OAK. Weeds 5(2): 121-132, 7 figs. Apr. 1957.

This shrubby oak proved hard to kill completely. Topkill was produced easily, but resprouting often occurred even when the root collar was wetted. Root collars were long and highly irregular, hard to treat thoroughly. High volumes of chemical were necessary to keep plants from resprouting after 2-3 years. It is recommended that observations be continued for at least 3 years after treatment of such plants.

X MAMMALS--GENERAL

Bodenheimer, F. S. (Hebrew U., Jerusalem.) THE ECOLOGY OF MAMMALS IN ARID ZONES. In Arid Zone Research--VIII. Human and Animal Ecology / Reviews of Research. UNESCO, 19 ave. Kléber, Paris-16e, France. p, 100-137, 12 figs., 2 pls. 1957.

Valuable review paper (154 references) that discusses much information on such topics as water metabolism, body temperature, burrows, wind, food habits, estivo-hibernation, reproduction, diel activity, sociability, vagility, populations, coloration, morphological adaptations, zoogeography, epizootics,

biology of domestic mammals. The paper is on a world basis and contains much data of natural history interest. Other papers in the volume discuss ecology of man, birds, and insects in arid regions. The bird paper is listed on p. 46 of this issue of WR.

Hall, E. Raymond, committee chairman. VERNACULAR NAMES FOR NORTH AMERICAN MAMMALS NORTH OF MEXICO. U. Kans. Mus. Nat. Hist., Misc. Publ. no. 14. 1-16 p. June 1957.
This list, the work of a number of people, suggests a vernacular name for each full species of mammal of the area covered. It is hoped that this list will do much to standardize and stabilize use of nontechnical names in the U.S. and Canada. The list seems unfortunately heavy in patronymics. While no one worker will like all names proposed here, it is likely that the great bulk of the names will be acceptable to everyone. It will be interesting to see whether or not editors will require conformity to this list.

Hoffman, Roger Alan. A COMPARISON OF THE ACTIVITY AND MORPHOLOGY OF THE THYROID GLAND OF A HIBERNATOR AND A NON-HIBERNATOR WITH A STUDY OF THE MORPHOLOGICAL CHANGES IN THE PITUITARY GLAND OF THE HIBERNATOR. Ph.D. thesis, Purdue U. 175 p. 1956. [From long abstract in Dissertation Abstracts 17(3).]
Important comparison of conditions in Citellus tridecemlineatus and white rat.

Jacobs, G. J. (Natl. Res. Council, Wash., D. C.) BLOOD VALUES OF TWO AMERICAN CARNIVORES. J. Mamm. 38(2): 261-262. May 1957.
Wild raccoon from Pa. and wild yearling black bear from N. Y.

Matthews, L. Harrison. (Zool. Soc. London.) THE MIGRATION OF MAMMALS. Smithsonian Ann. Rep. 1954(4199): 277-284. 1955. [From Biol. Abs. 31(4).]
Migration is not common among mammals, and is rarer in land animals than in those that live in a uniform medium so that they either fly or swim. Among land animals, caribou and bison have a more or less circular migratory path, but with little uniformity. A few spp. show local short migrations in winter, such as the descent of red deer to valleys and the movement of house mice from fields. The emigration of lemmings, an outward journey with no return, is not true migration. The red bat and the hoary bat migrate from n. to se. U. S. in winter, while some other bats hibernate. Fruit-eating bats in the tropics and gray-headed bats in Australia also migrate. Much longer migrations are accomplished by the fur seals from the Pribilof Islands off Alaska to the latitude of s. Calif. Many whales also make regular migrations over great distances. The means whereby these migrations are accomplished are completely unknown.--F. M. Foote.

Matthews, L. Harrison. THE HIBERNATION OF MAMMALS. Smithsonian Ann. Rep. 1955: 407-417, 2 pl. 1956. [From J. Mamm. 38(2).]

MAMMALS--FAUNAS AND MANUALS

Cameron, Austin W. (Natl. Mus. Can.) A GUIDE TO EASTERN CANADIAN MAMMALS. Natl. Mus. Canada, Ottawa. v + 72 p., illus. 1956. 50¢.
Popular guide, not intended for critical identifications. Keys are not provided; Cameron states that laymen will not use keys. Instead, a short, simple description and av. measurements are given for each species, along with notes on habitat and habits and statement of distribution in Canada. There are good drawings of most terrestrial species. Marine species are treated in text. An appendix lists subspecies and their local ranges. Area covered by the booklet is the provinces of New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland (exclusive of Labrador), and the part of Quebec s. and e. of St. Lawrence R.

Stallcup, William B. NOTES ON MAMMALS OF DALLAS COUNTY, TEXAS. Field & Lab. 24(3): 96-101. 1956. [From Biol. Abs. 31(5).]
Collecting data for 27 spp. are given with a list of 5 additional spp. reported by residents.--R. W. Dexter.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Anderson, Kenneth H., and Jacob Shapiro. (Maine Dept. Game, Augusta.) THE EFFECTS OF FLOODING ON A SMALL MARSH IN CENTRAL CONNECTICUT. Am. Midl. Nat. 57(2): 483-492, 1 graph. Apr. 1957.

Conclusions: "A large percentage of the small mammal population perished as a result of permanent flooding. A total of 2,418 snap trap nights in the border area during June and July after flooding attempts yielded 16 marked deer mice and one redback vole for a ratio of marked to unmarked of 11.7 percent. No animal marked in the marsh habitat was recovered. Deer mice utilized the 0-10 year age class (marsh type) more heavily in the summer than in the fall prior to flooding. After flooding this habitat was abandoned by deer mice. Trap mortality was greater in the fall than in the summer, for both the adult male and female deer mouse before flooding. After flooding, mortality was higher in the spring than in any other season before or after flooding. Approximately 74 percent of 194 deer mice marked in the entire study were retrapped. Two deer mice marked in the marsh before flooding were retrapped after flooding. There was no marked increase in the small mammal population on the islands after inundation. The animals with home ranges bordering the upland types were not adversely affected by flooding. Sex ratios of deer mice was 2 males to 1 female before flooding and 1.6 to 1 after flooding."

Frank, Fritz. (Inst. f. Grönlandfragen d. Biol. Bundesanstalt f. Landw. Forstwirtschaft. Oldenburg i.O., Germany.) THE CAUSALITY OF MICROTINE CYCLES IN GERMANY. J. Wildl. Mgt. 21(2): 113-121. Apr. 1957.

Factors favoring increase of Microtus arvalis populations are: (1) High reproductive potential based on (a) extremely early maturity and mating (in females, often before being weaned), (b) high reproductive efficiency (litter wts. to 53% of mother's wt.), (c) large litter size (maximum 12-13), av. in wild populations about 7 young, (d) rapid litter succession (pregnancy about 20 days, postpartum mating normal), and (e) extended season of reproduction (sometimes through winter). (2) High carrying capacity of environment under the optimal ecological conditions of plague districts, based on food, cover, ground-water level, sunlight, over-wintering places, and--last but not least--uniform structure of landscape. (3) High "condensation potential" based on behavior, particularly social mechanisms: (a) reducible home-range size during population increase, (b) formation of "great families," (c) formation of over-wintering communities, (d) communal nesting of females, and (e) reduction of males. Cyclic periodicity is 3 yrs.; deviations are uncommon. Unusually severe winters synchronize periodicity of isolated populations over large districts. Ecological control for crop protection is proposed rather than the usual control by chemicals or by encouragement of enemies and parasites.--Frances Hamerstrom.

Harrison, J. L. SOME SMALL MAMMALS OF BOOKHAM COMMON. Lond. Nat. 35: 12-20. 1955 (1956). [From J. Anim. Ecol. 26(1).]

"The relative abundance of small mammals in damp oakwood, grass with scrub, an area transitional between them and wet valley bottom [was] assessed by means of traps in late 1955. The species captured, Sorex araneus, Neomys fodiens, Clethrionomys glareolus, Microtus agrestis, Apodemus sylvaticus and Micromys minutus, did not vary greatly in the four areas. More A. sylvaticus were caught in the wood than elsewhere. C. glareolus was significantly more numerous in the live than break-back traps. Owl pellets contained the remains of more voles and fewer shrews than were trapped; also four additional species. Includes a note on infestation of Apodemus, Clethrionomys and Microtus by the mite, Trombicula autumnalis, a review of the factors affecting numbers of mammals caught in traps, a description of an inexpensive live trap, and a key to the 13 species likely to occur in the area."

Murray, Keith. (Bureau of Vector Control, 2151 Berkeley Way, Berkeley, Calif.) PROBLEMS OF SMALL MAMMAL SAMPLING. Calif. Vector News 4(6): 35, 39. June 1957.

Several live-trapping studies in various parts of Calif. were made where different habitats came together. Populations were much higher in some habitats (especially brush) than in others. Relatively few individuals were caught in more than one habitat; i.e., there was little movement between habitats. It was evident that quick sampling of rodents of an area, as for public health purposes,

could be misleading if habitat variation were not considered. Author suggests (1) trapping only reasonably uniform habitats, when this meets the need, (2) devising trapping plan to fit the individual problem area, and (3) drawing very limited conclusions if little trapping can be done. [A 4th choice, not mentioned by author, would seem to be roughly proportional trapping of major habitats present in an area. Perhaps this would involve too much trapping for the purpose.]

New, John Gabriel. NEW TECHNIQUES, USING DYES, FOR STUDYING THE MOVEMENTS OF SMALL MAMMALS. Ph.D. thesis, Cornell U. 146 p. 1956. [From long abstract in Dissertation Abstracts 17(3).]

Over 100 dyes were tested in lab. and 46 were found suitable for field trials. Dyed baits were placed in boxes on 50-foot grid in a field and a woodlot. Distances of travel were revealed by colored scats in boxes. Blarina brevicauda moved shorter distances in woods than in field. One Blarina visited 8 stations (1.5 acre) in 24 hours. Peromyscus leucopus ranged farther than Blarina or Microtus pennsylvanicus. Areal and linear estimates, based on modified averages of distances moved, compared favorably with home range data from literature. All stations were baited with dyes and snap-trapped within 12-24 hours. About half the Microtus and Blarina snap-trapped were dye-marked, but most (83% and 100%) of Peromyscus were marked. Some Peromyscus had 4 dyes, indicating travel of at least 250 feet. Peromyscus had more dyes and retained them longer than Blarina or Microtus because they travel farther, are less fossorial, have lower metabolism, and because their long tails pick up and retain dyes. Dyes found suitable in field, and initial of genus for which acceptable, are: Rosanilin hydrochloride, B, M, P; Orange I, B; Fluorescein, B; Fast green FCF, B, M, P; Niagara sky blue 6B, B; and Wool violet 4BN, B, P, not tried on M. Other dyes are recommended as substitutes or for further testing. Several were useful because of fluorescence. Alizarin coated the teeth of mice and was recovered from some Peromyscus after 9 days. Sudan III stained fat vivid orange and was recovered in Peromyscus 3 days after bait removal and in Blarina after 10 days. Potentialities of dye techniques are discussed.

Shadowen, Herbert Edwin. RODENT POPULATION DYNAMICS IN UNCULTIVATED FIELDS OF LOUISIANA. Ph.D. thesis, La. State U. 98 p. 1956. [From abstract in Dissertation Abstracts 17(3).]

Two plots, 1.67 acres and 2.98 acres, near Baton Rouge, were live trapped with 100 traps each for 2-16 days at a time for 1 year. Small mammals were marked and released. Species caught, in order of frequency, were Sigmodon hispidus, Reithrodontomys fulvescens, R. humulis, Cryptotis parva, Oryzomys palustris, and Mus musculus. Data were obtained on time of activity, season of reproduction, sex ratios in catch, weights, numbers caught on plots, and extent of movements on plots. Statements are made on populations per acre and on sizes of home ranges. [These statements appear to be highly questionable owing to excessively small size of plots, and because population densities are expressed only in terms of totals of all animals caught, regardless of border-resident and other problems. Per-acre population figures probably are several times too high to represent resident populations, and home range estimates almost certainly are too small.]

Starner, Bette A. (U. Fla.) NOTES ON THE MAMMALS IN THREE HABITATS IN NORTH FLORIDA. Quart. J. Fla. Acad. Sci. 19(2/3): 153-156. 1956. [From Biol. Abs. 31(5).]

Mammals were trapped and observed in 3 habitats. Some show habitat preferences. Seven of the 13 spp. recorded inhabit only 1 site, while the remaining 6 spp. utilize either all sites or more than one site. Measurements and reproductive data are given. Frequency of capture of the smaller mammals is analyzed. --B. A. Starner.

MAMMALS--PARASITES AND DISEASES

Bacon, Marion. COMPARATIVE SUSCEPTIBILITY OF VARIOUS SPECIES OF MICE NATIVE TO WASHINGTON TO INOCULATION WITH VIRULENT STRAINS OF PASTEURELLA PESTIS. Ph.D. thesis, State Coll. Wash. 82 p. 1956. [From long abstract in Dissertation Abstracts 17(4).]
Experimental study of infection of native rodents with plague.

Holloway, Harry Lee, Jr. NOTES ON THE HELMINTHS OF MAMMALS IN THE MOUNTAIN LAKE [VIRGINIA] REGION. Ph.D. thesis, U. Va. 158 p. 1956. [From long abstract in Dissertation Abstracts 17(3).]
Descriptions of new species of worms and studies on morphology, hosts, and life cycles of various other worms.

Malaga-Alba, Aurelio. (Pan Am. Sanitary Bureau, Mexico City.) RABIES IN WILDLIFE IN MIDDLE AMERICA. J. Am. Vet. Med. Assn. 130(9): 386-390. May 1957.
Summary: "The continental wildlife in Middle America constitutes a reservoir for the perpetuation of rabies. It has been responsible for periodic epizootics in almost all of the countries and, also, for the transmission of rabies across international borders. The presence of mongoose rabies in five major islands of the Caribbean Sea presents a serious obstacle to eradication and a threat to those islands with a large mongoose population which, at present, are rabies free. The migratory nature of the flights (some of 800 miles) of Tadarida brasilensis mexicana have a seasonal regularity associated with reproduction rather than a lack of food. Observations over a period of four years indicate that rabies is enzootic in Tadarida and is not the result of casual contact with hematophagous bats."

Menges, Robert W., and Lucille K. Georg. (US Pub. Health Serv., Communicable Dis. Center, Chamblee, Ga.) SURVEY OF ANIMAL RINGWORM IN THE UNITED STATES. Pub. Health Rep. 72(6): 503-509, 2 maps. June 1957.

Osebold, John W., Gordon Shultz, and E. W. Jameson, Jr. (U. Calif. Sch. Vet. Med., Davis.) AN EPIZOOTIOLOGICAL STUDY OF LISTERIOSIS. J. Am. Vet. Med. Assn. 130(11): 471-475, 1 fig. June 1, 1957.
Summary: 1) A total of 107 specimens of wild mammals and birds were collected in an area [s. Solano Co., Calif.] undergoing an epizootic of listeriosis involving sheep on five ranches and one herd of cattle. 2) There was evidence of a population decline among raccoons and skunks preceding and during the time that the ruminants were affected. 3) Listeria monocytogenes was recovered from the liver, bile, intestinal contents, spleen, kidneys, and urine of a striped skunk (Mephitis mephitis). 4) The Listeria strains from the sheep on various ranches, the cow, and the skunk all belonged to serological type 4b."

Rausch, Robert. (Arctic Health Res. Center, Anchorage, Alaska.) STUDIES ON THE HELMINTH FAUNA OF ALASKA. XXX. THE OCCURRENCE OF ECHINOCOCCUS MULTILOCULARIS LEUCKART, 1863, ON THE MAINLAND OF ALASKA. Am. J. Trop. Med. & Hygiene 5(6): 1086-1092, 5 figs. Nov. 1956.
E. multilocularis (= E. sibiricensis), whose larvae cause alveolar hydatid disease in man, is first reported from Am. mainland. Apparently it occurs widely in Alaska. Larvae are in microtine rodents, adults in foxes and dogs. There is danger that this highly injurious worm may become established in U. S. and Canada by transportation of infected dogs. Detailed comparisons are made between this worm and the far less dangerous and better known E. granulosus.

Various authors. RABIES. Bul. World Health Org. 10(5): 703-866, illus. 1954.
Fifteen papers on control and prevention of rabies. Authors are from various countries and present varied viewpoints. The 2 papers of chief wildlife interest are Rabies in Canada, with special reference to wildlife reservoirs, by P. J. G. Plummer, and Transmission of rabies by bats in Latin America, by Victor Carneiro.

Wilson, Nixon. (522 N. 3d St., Bardstown, Ky.) SOME ECTOPARASITES FROM INDIANA MAMMALS. J. Mamm. 38(2): 281-282. May. 1957.
Report of 1 sp. of beetle, 6 of fleas, 5 of lice, 4 of ticks, and 4 of mites from 11 spp. of mammals.

Crowcroft, Mrs. Gillian K. Godfrey. (Zool. Soc. London.) OBSERVATIONS OF THE MOVEMENTS OF MOLES (TALPA EUROPAEA L.) AFTER WEANING. Proc. Zool. Soc. London 128(2): 287-295, 3 figs., 1 pl. Apr. 1957.

Pregnant females were equipped with rings bearing radioactive cobalt and their ranges were determined with a Geiger-Müller counter. Some of their young were also tagged. Movements were studied for 10 weeks after weaning. Young became familiar with their mother's ranges within a few days after leaving nest and remained in them for the entire period. There was no obvious correlation between the age at which dispersal occurred and reproductive condition. Local food shortage seems likely to be an important factor determining age at which dispersal occurs.

de Vos, Antoon. (Ont. Agr. Coll., Guelph.) PEAK POPULATIONS OF THE MASKED SHREW IN NORTHERN ONTARIO. J. Mamm. 38(2): 256-258. May 1957.

Reports exceptionally large populations of Sorex cinereus in late summer of 1955 and perhaps into winter of 1955-56. Apparently the population had crashed by spring of 1956.

Eads, R. B., J. S. Wiseman, and G. C. Menzies. (Texas Dept. Health, Austin.) OBSERVATIONS CONCERNING THE MEXICAN FREE-TAILED BAT, TADARIDA MEXICANA, IN TEXAS. Texas J. Sci. 9(2): 227-242, 4 figs. June 1957.

These bats, of interest in connection with rabies, are present by millions in certain caves of central Texas. The paper describes the caves and gives data on times of migration, times of flights, reproduction, other kinds of bats in caves with T. mexicana, and on recoveries of banded bats. Predatory vertebrates noted in and around caves are discussed. Ecto- and endoparasites of T. mexicana are listed. Predatory and other arthropods found in the bat caves are also mentioned.

Johnston, Richard F., and Robert L. Rudd. (N. M. A & M Coll., State Coll., N. M.) BREEDING OF THE SALT MARSH SHREW. J. Mamm. 38(2): 157-163, 2 graphs. May 1957.

Summary: "Sorex vagrans halicoetes on San Francisco Bay salt marshes in California lives mainly in the Salicornia zone and finds foraging, breeding, and resting sites under stranded driftwood. The season for births runs from late February to early June; a small amount of breeding occurs in September. Mean litter size in utero is 5.55 and in nests 1 to 2 weeks old it is 4.74; mortality to the age of about one week in surviving litters is thus at least 15 per cent of total implantations. Young shrews gain weight rapidly, reaching 5 to 6 grams at about 30 days of age; following dispersal from the nest, weights decline and 2- and 3-month old shrews weigh about 1 gram less. Survival of young from shortly after birth to 3 weeks is 55 to 60 per cent; litter size has no influence on mortality."

Mann, P. M., and R. H. Stinson. (U. Toronto, Ont.) ACTIVITY OF THE SHORT-TAILED SHREW. Can. J. Zool. 35(2): 171-177, 3 figs. Apr. 1957.

Abstract: "The 24-hour activity of Blarina brevicauda talpoides was recorded by means of tilting activity cages with the food and water placed (i) at the end farthest from the next box and (ii) in the nest box. The shrews were active on the average less than 10% of the time, although considerable variation occurred both within and between individuals. Activity continued throughout the 24 hours with marked disturbances in late afternoon and early morning, associated with the feeding times. In individual daily records the activity often appeared in a series of short bursts. The average length of the bursts was 49 minutes and of the intervals between them 99 minutes. Changing the position of the food and water had little effect upon the 24-hour pattern."

Morrison, Peter R., Marybelle Pierce, and Fred A. Ryser. (U. Wis.) FOOD CONSUMPTION AND BODY WEIGHT IN THE MASKED AND SHORT-TAIL SHREWS. Am. Midl. Nat. 57(2): 493-501, 3 figs. Apr. 1957.

Summary: "Food consumption was measured in 8 individuals each of 3 g Sorex cinereus and 21 g Blarina brevicauda. Average rates at 25° were 1.58 and 0.56 g/g day for beef liver. When expressed as the energy equivalent these are about 10% higher than those derived from measurements of oxygen consumption. Newborn rats were preferred over liver, ground beef and worms in that order.

In Sorex feeding activity could be as intense as 17 periods per hour, but averaged 4 periods per hour, and intervals between feeding of as long as an hour were observed only rarely. In both species the constancy of the body weight was comparable to that in mice (♂ =3.2-3.6%)."

Pruitt, Wm. O., Jr. (Box 282, College, Alaska.) A SURVEY OF THE MAMMALIAN FAMILY SORICIDAE (SHREWS). Säugetierkundliche Mitteilungen 5(1): 18-27. Jan. 1957.

In English. Cites scores of references and gives brief discussions of findings in them under many headings such as Diagnosis, Habits, Distribution, Classification, Adaptive Radiation, Importance to Man, and Problems. The paper should be useful as a guide to literature on shrews.

RABBITS AND PIKAS

Anon. BIBLIOGRAPHY OF PUBLICATIONS CONCERNING MYXOMATOSIS IN AUSTRALIA. J. Australian Inst. Agr. Sci. 21(4): 254-255. Dec. 1955. [From J. Mamm. 38 (2).]

Gough, H. C. GRAZING OF WINTER CORN BY THE RABBIT (ORYCTOLAGUS CUNICULUS (L.)). Ann. Applied Biol. 43: 720-734. 1955. [From J. Anim. Ecol. 26(1).]

"A study of the grazing patterns of rabbits on fields of winter cereals. Areas nearest to the warrens were grazed for a long period, and the crop failed; furthest areas were grazed lightly or not grazed. Severe grazing prevented the formation of secondary roots and tillers." [This is the same beast that is still being liberated in the U. S. under the alias of San Juan rabbit.]

Ingleby, J. A. SHEEP, FOXES AND RABBITS. Scot. Agr. 36: 69-70. 1956. [From J. Anim. Ecol. 26(1).]

"Sheep flocks in Aberdeenshire have benefited by the disappearance of rabbits and have not suffered unduly from predators, despite the increased numbers and wider distribution of foxes." [It seems exceedingly odd that foxes increased so soon after die-off of rabbits from myxomatosis.]

Lemke, C. W. (Wis. Cons. Dept.) AN UNUSUALLY LATE PREGNANCY IN A WISCONSIN COTTONTAIL. J. Mamm. 38(2): 275. May 1957.

An old ♀ contained 10 embryos on Nov. 21, 1955.

Lockie, J. D. AFTER MYXOMATOSIS. NOTES ON THE FOOD OF SOME PREDATORY ANIMALS IN SCOTLAND. Scot. Agr. 36: 65-69. 1956. [From J. Anim. Ecol. 26(1).]

"Feeding preferences of the fox before and after the reduction in rabbit numbers by myxomatosis. Samples are taken from the Lowlands, Cairngorms, and Wester Ross. Changes are also reported for the buzzard, golden eagle, pine marten, weasels and stoats. The vacant ecological niche caused by myxomatosis is becoming filled by hares and voles."

Price, Donald L. (2d Army Med. Lab., Fort Meade, Md.) DIROFILARIA UNIFORMIS, N. SP., (NEMATODA: FILARIOIDEA) FROM SYLVILAGUS FLORIDANUS MALLURUS (THOMAS) IN MARYLAND. Proc. Helminth. Soc. Wash. 24(1): 15-19, 8 figs. Jan. 1957.

Rendtorff, Robert C., and Aimee Wilcox. (U. Tenn. Sch. Med., Memphis.) THE ROLE OF NEMATODES AS AN ENTRY FOR VIRUSES OF SHOPE'S FIBROMAS AND PAPILLOMAS OF RABBITS. J. Infect. Dis. 100(2): 119-123. Mar.-Apr. 1957.

Sheffer, Dale E. (Md. Game Comm.) COTTONTAIL RABBIT PROPAGATION IN SMALL BREEDING PENS 1956. Md. Cons. 34(3): 23-25, 2 photos. May 1957.

Pens of 1/16 acre, 1/8 acre, and 1/4 acre were used. The small pens, 50 x 50 feet, proved best. Combinations of 1 ♂ with 2-4 ♀♀ and 2 ♂♂ with 6 or 8 ♀♀ were tried. One ♂ could serve 4 ♀♀ satisfactorily; 85 young were produced in this pen. Two ♂♂ in a pen did not fight, but production was lower than when only 1 ♂ was present; production was 13 per ♀ rather than 19. Females produced well in their second year of pen breeding. Av. production was 20 per ♀ in small pens, less in larger pens. Total production of young in 1956 was 287, but there were 135 losses, so net production was 152. Cost per young reared to release was about $1.70.

Sheffer, Dale E. (Md. Game Comm.) MARYLAND STUDIES OF RABBIT STOCKING. Md. Cons. 34(3): 11-13, 1 photo. May 1957.

In the fall of 1955, 220 adult cottontails "that were raised under natural conditions at Gwynnbrook State Game Farm" were tagged and released over a 5-county area. Only 4 are known to have been recovered. Twenty others were released on a farm 10 days before hunting began. The farm was checked throughout the season. No tagged rabbits were bagged but 3 were found dead on opening day. In another type of trial, 1/3-grown rabbits were released. Fifty were placed on 1 farm in June and July. Two were bagged in hunting season and 1 was taken later in live trapping. Forty young were placed on a second farm in Oct. Three of these were bagged and 1 was later live-trapped. Recovery rates were thus 6% and 10%. Much larger numbers of untagged rabbits were bagged and live-trapped on the 2 farms. "...the above would indicate once again that rabbit stocking does very little to increase the native rabbit population."

Sowls, Lyle K. (U. Ariz.) REPRODUCTION IN THE AUDUBON COTTONTAIL IN ARIZONA. J. Mamm. 38(2): 234-243, 2 graphs. May 1957.

The species is common in deserts of Ariz. Between 1951 and 1955, 407 individuals were collected for study of reproduction. Sex ratios were almost even. Females were heavier than males. Breeding season began about Jan. 1 in s. Ariz. and ended in late Aug. No correlation was found between reproduction and rainfall. Litter size varied from 2-4, av. 2.9. Of 31 pregnant or lactating females collected in July and Aug., 11 were less than 9 months old as indicated by humerus. Low litter size is compensated for by long breeding season and by breeding of juvenile females.

Taylor, R. H., and R. M. Williams. (Applied Math. Lab., Dept. Sci. & Indust. Res., Wellington, N. Z.) THE USE OF PELLET COUNTS FOR ESTIMATING THE DENSITY OF POPULATIONS OF THE WILD RABBIT, ORYCTOLAGUS CUNICULUS (L.). N. Z. J. Sci. & Technol. Ser. B. 38(3): 236-256, illus. 1956. [From Biol. Abs. 31(5).]

A technique is described for estimating rabbit populations from the density of faecal pellets on the ground. The method involves two steps: (1) estimating the number of pellets present, and (2) relating the number of pellets to the number of rabbits by measuring the rate at which pellets decay, and the number of pellets produced daily by individual rabbits. The theory and field procedure of sampling methods devised to measure the density of pellets and their decay rate are given. Attempts made to determine the mean number of pellets produced per rabbit per day resulted in a figure of 820 being accepted for the wild rabbit in New Zealand. The results from several trials carried out during the development of the method are discussed, and an example is given of its practical applications.--Auth. summ.

White, D. G., D. E. H. Frear, and R. G. Wingard. (Pa. State U.) RABBIT REPELLENTS FOR DORMANT APPLE TREES. Pa. State U. Coll. Agr., Progress Rep. 157. 4 unnumbered p., 6 photos. Oct. 1956.

Summary: "Nine materials applied to the trunks of young apple trees were tested as repellents for cottontail rabbits. A proprietary material called "Ringwood" was the best and nicotine sulfate in asphalt paint was practically as good. "Ringwood" was relatively expensive, however, and the asphalt paint was rather messy. Under natural conditions probably rosin in alcohol or lime sulfur would be satisfactory repellents and would be less troublesome and less expensive than many others. Home gardeners often could protect their trees most easily with wire guards or by wrapping the trunks in the dormant season with paper or aluminum foil."

RODENTS--MISCELLANEOUS

Aldous, Clarence M. (444 Federal Bldg., Salt Lake City, Utah.) FLUCTUATIONS IN POCKET GOPHER POPULATIONS. J. Mamm. 38(2): 266-267, 1 graph. May 1957.

Evidence that pocket gopher populations fluctuated on study areas in central Utah, 1943-55.

Allred, Dorald M. (Brig. Young U., Provo, Utah.) MITES FOUND ON MICE OF THE GENUS PEROMYSCUS IN UTAH. III. FAMILY DERMANYSSIDAE. Am. Midl. Nat. 57 (2): 450-460, 74 figs. Apr. 1957.

Barbehenn, Kile R., and John G. New. (New: State U. Teach. Coll., Oneonta, N. Y.) POSSIBLE NATURAL INTERGRADATION BETWEEN PRAIRIE AND FOREST DEER MICE. J. Mamm. 38(2): 210-218, 3 figs. May 1957.

P. m. bairdii, P. m. gracilis, and P. leucopus were all caught in the same old fields at Arnot Forest, Tompkins Co., N. Y. at time of a population high in fall of 1954. Skeletal and statistical studies were made to identify all individuals and to see if any intermediates occurred. No intermediates were definitely identified. The paper gives much data on identification of the 3 kinds of mice by means of number and size of caudal vertebrae.

Chitty, Helen, and C. R. Austin. ENVIRONMENTAL MODIFICATION OF OESTRUS IN THE VOLE. Nature 179(4559): 592-593. Mar. 16, 1957.

Microtus agrestis kept in the laboratory in different types of social groups showed different oestrus behavior. "We have...come to the conclusion that the field vole is capable of showing two kinds of oestrous behaviour: a typical short oestrous cycle as in rats and mice, with sexual receptivity restricted to a particular stage of the cycle, or else prolonged periods of an oestrous state as in rabbits and cats, during which coitus is effected at any time and is associated with induced ovulation... ...it is our contention that the hormonal pattern in voles is less rigidly defined than in the other animals mentioned, so that environmental conditions may exert a decisive influence."

Drummond, Roger O. (Ent. Res. Lab., Box 232, Kerrville, Texas.) OBSERVATIONS ON FLUCTUATIONS OF ACARINE POPULATIONS FROM NESTS OF PEROMYSCUS LEUCOPUS. Ecol. Monog. 27(2): 137-152, 5 figs. Apr. 1957.

141 species of Acarina were collected over a period of time from nest boxes equipped with collecting funnels.

Duke, Kenneth L. (Duke U. Sch. Med., Durham, N. C.) REPRODUCTION IN PEROGNATHUS. J. Mamm. 38(2): 207-210, 6 figs. May 1957.

Summary: "In Utah both the male and female of the genus Perognathus have a restricted period of reproductive activity during the year: from early April (perhaps earlier) to early July. Two litters may be borne by some females, especially in the southern limits of the range, and in the early breeders, but one is probably more common. The average litter size is 5.38 and the mode is 5." Species studied were formosus, longimembris, and parvus.

Hansen, Richard M. (Colo. State U., Fort Collins.) INFLUENCE OF DAYLENGTH ON ACTIVITY OF THE VARYING LEMMING. J. Mamm. 38(2): 218-223, 4 figs. May 1957.

Harrison, J. L. (Inst. Med. Res., Kuala Lumpur, Malaya.) SURVIVAL RATES OF MALAYAN RATS. Bull. Raffles Mus. 27: 5-26, illus. 1956. [From Biol. Abs. 31 (7).]

The central part of Malaya has an unusually uniform climate, and the rats exhibit no breeding season. The size of a rat can, therefore, be related to its age, and tables of weight and age are given founded partly upon mark-recapture experiments, and partly upon caged animals. The weights at different ages are applied to the weight distribution of a large random collection to obtain life tables which are expressed graphically. It appears that, at least for the first few months of life, the survival rate is constant. The survival rates of rats marked at different ages are compared, and no significant differences are found. Results of marking experiments are, therefore, consolidated, and treated graphically to give an estimate of mean survival rates. The survival rates obtained by these two methods are compared with one another and with the reproduction rate estimated from data previously published. Estimates from the weight distribution are fairly consistently higher than those from marking, which latter give close agreement with the birth rates. A summary of estimated survival rates is given for the twelve species.--Auth. summ.

Hooper, Emmet T. (U. Mich. Mus. Zool.) DENTAL PATTERNS IN MICE OF THE GENUS PEROMYSCUS. U. Mich., Mus. Zool., Misc. Publ. no. 99. 1-59 p., 24 figs. Mar. 1957. 75¢.

Detailed, technical study of molar patterns in series of specimens of 17 species. It is shown that there is much individual and geographic variation in molar patterns and that too much taxonomic weight has been assigned to these patterns in the past. Relationships should be determined from many characters and dental characters should not be overemphasized.

King, John A. (Jackson Mem. Lab., Bar Harbor, Me.) INTRA- AND INTERSPECIFIC CONFLICT OF MUS AND PEROMYSCUS. Ecology 38(2): 355-357. Apr. 1957.

Summary: "The aggressive behavior of 16 Peromyscus maniculatus bairdii and the C57BL/10 inbred strain of 16 Mus musculus was measured in individual combats with members of the same species and members of the other species. The Mus were more aggressive than Peromyscus in both intraspecific and interspecific combats. Patterns of aggressive behavior characteristic for each species tend to be maintained when both species encounter each other. The great aggressiveness of Mus suggests that they are capable of driving Peromyscus out of natural situations whenever the two species frequently encounter each other."

Klein, Harold G. (Cornell U.) INDUCEMENT OF TORPIDITY IN THE WOODLAND JUMPING MOUSE. J. Mamm. 38(2): 272-274. May 1957.

"In the fall, jumping mice are found with a large accumulation of fat. Results of experiments described here appear to indicate that the withholding of food induced them to go into a state of torpidity."

Manning, T. H. THE NORTHERN RED-BACKED MOUSE, CLETHRIONOMYS RUTILUS (PALLAS), IN CANADA. Natl. Mus. Can., Bul. 144. iv + 67 p., 21 figs., 1 col. pl. 1956. $2.00.

Study of variation and taxonomy. Three races, 1 new, are recognized, but the bulk of the paper is devoted to an extremely detailed analysis of variation in skulls and skins. Age determination is considered at length. Reproduction, growth, and sexual maturity are analyzed so far as data permit. Possible origin and relationships of Canadian races are discussed. The paper is of special interest as an example of the enormous amount of laborious analysis and mathematics involved in modern taxonomic work.

Schwartz, Albert, and Eugene P. Odum. (Albright Coll., Reading, Pa.) THE WOODRATS OF THE EASTERN UNITED STATES. J. Mamm. 38(2): 197-206, map & graph. May 1957.

Neotoma magister is shown to be a race of N. floridana. The 6 races of N. floridana are described, their variation is tabulated, and their ranges are mapped.

RATTUS AND MUS

Bentley, E. W., L. E. Hammond, and Eileen J. Taylor. (Infestation Control Div., Tolworth, Surbiton, Surrey, Eng.) THE COMPARATIVE TOXICITY OF 0.025 PER CENT AND 0.005 PER CENT WARFARIN ON RATTUS NORVEGICUS. Plant Pathol. 4(4): 120-123. 1955. [From Biol. Abs. 31(3).]

It was discovered that the stronger concentration was as acceptable as the weaker. Since the rats would not need to feed on the 0.025% bait as many times to receive the lethal dose the laboratory results suggest that there is an advantage in using the stronger concentration. Further, the results of 24- and 48-hour tests indicate that more of the rats that visit the baits infrequently will be killed.--K. W. Loucks.

Smith, Wm. W. (US Pub. Health Serv., Newton, Ga.) FACTORS INFLUENCING THE DECLINE IN COMMENSAL RAT INFESTATIONS IN A RURAL AREA IN SOUTHWESTERN GEORGIA. J. Mamm. 38(2): 270-271. May 1957.

From summary: "Recent inspection and trapping of 95 premises previously inspected for rat infestation in 1946 indicated that only about one-third of these premises are now rat-infested, while over nine-tenths had rat infestations in 1946. It is postulated that the series of six drought years (1949-1955) was

one of the chief factors to which the decline in rat infestations of farms may be attributed. The return of a series of years of normal precipitation would likely result in a rise in the prevalence rate of rat infestations, and presumably in murine typhus in both rats and humans."

SCIURIDS

Panuska, Joseph A., and Nelson J. Wade. (St. Louis U., Mo.) FIELD OBSERVATIONS ON TAMIAS STRIATUS IN WISCONSIN. J. Mamm. 38(2): 192-196. May 1957.
Data are given on reaction to capture, sex ratios, water consumption, field weights, weight changes, mating periods, and possible aestivation. "Sex ratios differed from year to year; the over-all average for 271 animals was 44.9 per cent male and 55.1 per cent female. The average daily water consumption of caged animals, measured by drinking tubes, was 33.4 ml., and the average field weight was 85.4 grams. 11.6 per cent weight increases were noted after one day of captivity, 22.8 per cent after six days of captivity. There were great fluctuations in weight depending on presence or absence of food."

BEAVER

Dorland, J. S. (Ont. Dept. Lands & For.) BEAVER IN LAKE SIMCOE DISTRICT. Sylva 13(2): 37-40, 2 photos. Mar.-Apr. 1957.
Quantitative account of history and status of beaver in a 5-county region in vicinity of Toronto, Ont. Present southward invasion and increase in an area of heavy human population is liable to prove troublesome.

Guenther, Stan. (Wash. Dept. Game.) A BEAVER BAFFLER. Wash. State Game Bul. 8(3): 3, 6, 2 figs. July 1956.
Beavers are incredibly persistent and effective in finding ways of blocking culverts and holes in dams. They have been stopped, however, by the lane fence described and illustrated here. The fence consists of woven wire and is 3 or more feet high. It is really a double fence, with the lines of fencing 2.5 to 3 feet apart and joined at the ends. It is extended 30 or 40 feet into the pond from the culvert or outlet that is to be protected. Several cross-partitions of the woven wire are inserted to stop beavers that tend to dig under the fence. When desirable, the fence can be extended from the pond through the dam and well downstream.

Hay, Keith G. (Colo. Game Dept.) RECORD BEAVER LITTER FOR COLORADO. J. Mamm. 38(2): 268-269. May 1957.
Female of 69 lbs. contained 8 large fetuses.

Kitts, W. D., R. J. Bose, A. J. Wood, and I. McT. Cowan. (U. of B. C., Vancouver.) PRELIMINARY OBSERVATIONS ON THE DIGESTIVE ENZYME SYSTEM OF THE BEAVER (CASTOR CANADENSIS). Can. J. Zool. 35(3): 449-452. June 1957.

Libby, Wilbur L. (U. Alaska.) OBSERVATIONS ON BEAVER MOVEMENTS IN ALASKA. J. Mamm. 38(2): 269. May 1957.
One beaver, tagged when 2 years old, traveled at least 150-200 mi. Of 121 others, 2 traveled at least 6 mi., 16 traveled more than 1 but less than 6 mi., 16 moved less than 1 mi., and 87 were recovered in vicinity of tagging.

MacLennan, J. M., translator. TRANSLATIONS OF RUSSIAN GAME REPORTS. VOL. 1. (BEAVER, 1951-55). Can. Wildl. Serv., Ottawa. 1-109 p., illus., proc. 1957. 50¢ from Queen's Printer, Ottawa, Ont., Canada.
Seven papers from the Russian annual, "Biology of Furbearers," which is issued by All-Union Scientific Research Institute of the Hunting Industry. The river beaver in Archangel province, by B. T. Semyonoff, discusses dispersal of animals transplanted for restoration, foods, characteristics of favorable and unfavorable habitats, reproduction, construction work by beavers, predators, and biological adaptation of beavers to the new environment. Acclimatization of the beaver in the Ob river basin, by A. P. Zhdanoff, tells of results of restoration work, with emphasis on dispersal, habitats, foods, and beaver

construction. Distribution of the river beaver in the Ukraine SSR, by Y. N. Kirilloff, takes up present distribution, size of population, effect of drought on travels, and management by keeping banks vegetated with trees and brush and planting willows. Beaver biology in winter in Archangel province, by B. T. Semyonoff, is an unusually interesting account of biology and behavior in relation to ice conditions in area where ice lasts 6 months. It shows how introduced beavers adapted to northern conditions, and discusses activities and feeding under and over ice. Beavers are not solely dependent on their food stores; they come through holes in ice and feed on land, and they travel and feed extensively in air space under ice. Their survival can be favored by providing food for them under water or at holes in ice, but such provision may not be necessary, as all beavers were in good condition. Re-acclimatization of the river beaver in the Tatar ASSR, by A. V. Popoff, describes results of restoration work and the release sites. Experimental treatment of travassosiosis in river beavers, by N. P. Romanova and V. S. Pokrovski, reports on efforts to control the nematode, Travassosius rufus, and the trematode, Stichorchis subtriquetrus, in beavers designated for transplanting. Chenopodin oil mixed with castor oil was useful if followed by phenothiazine of at least 1.0 g. per kg. Phenothiazine alone was inadequate. The treatment was not satisfactory for young T. rufus. Experimental planting of willows in beaver habitat in the Tchetchersk district, by N. I. Fomicheva, tells how seedlings and cuttings were planted and what the results were. Seedlings did better than cuttings, but both did well. Some early use by beavers caused cuttings to make new sprouts but did not kill them.

Rupp, Robert S. (U. Calif., Berkeley.) BEAVER-TROUT RELATIONSHIP IN THE HEADWATERS OF SUNKHAZE STREAM, MAINE. Trans. Am. Fish. Soc. 84: 75-85. 1954 [1955].

Abstract: "The effect of beaver...on an eastern brook trout...population was studied in the vicinity of five beaver dams in the headwaters of Sunkhaze Stream. The beaver dams were found to present a serious obstacle to trout movements but they were not a complete barrier. Estimated unit-area production of bottom organisms was poor in the beaver ponds but the beaver had so increased the bottom area that total production of the stream section was probably more than doubled. Forage fishes appeared to be somewhat more abundant in the beaver ponds than in the open stream and constituted an unexpectedly high percentage of the food of 6- to 10-inch brook trout taken in the ponds. Measurable but not serious water-quality reduction was found in and below the beaver ponds."

Shadle, Albert R. (U. Buffalo.) SIZES OF BEAVER CHIPS CUT FROM ASPEN. J. Mamm. 38(2): 268. May 1957.

MUSKRAT AND NUTRIA

Dean, Frederick C. AGE CRITERIA AND KIT GROWTH OF CENTRAL NEW YORK MUSKRATS. Ph.D. thesis, N. Y. State Coll. For., Syracuse U. 79 p., 14 figs. June 1957.

Over half of the 1954 muskrat harvest from 2 large cat-tail marshes, 1 stream, and a Maine bog was used in a comparative study of zygomatic-breadth age criteria. Estimates of sub-adult / adult separation points, made from frequency polygons, reflected general quality of the 4 habitats. Determination of age-separation points from frequency data alone is not safe enough for recommendation. Absolute gain within size classes was fairly uniform irrespective of habitat quality. Original zygomatic breadth of skulls with 1 broken arch may be "reconstructed" to the nearest millimeter by doubling the existing half. No correlation existed between zygomatic breadth and condition of upper M_1; thus it is questionable that both criteria are well correlated with age. Pre-weaning growth of kits was studied on an area having an apparently poor food supply for adults. Rate of gain of weight was found to be essentially the same as reported from good habitats in Iowa and Wis. The difference in rate of tail length increment between N. Y. and Wis. areas was significant statistically, but not to management. Tail length, weight, and hind-foot length are recommended, in that order, as age criteria. Equations are presented to describe growth of total length, body length, and zygomatic breadth.--Author.

Ehrlich, Stefan. PHENOMENA OCCURRING AMONG THE NUTRIA-COYPU POPULATION AND REDUCTION IN THEIR NUMBERS. Ekologia Polska (Warszawa), Seria A, 4(5): 171-212, 3 figs. 1956 (1957). [Copy in US Dept. Int. Library.]

In Polish with English "summary" that presents most of paper. Studies were made of nutria confined by the hundreds in fenced, marshy ponds of a few acres each. Food was provided in boxes. Some results of this Polish work are specific to the situations, others are of general interest. Many nutria were added to an established population. New ones were dominated and remained in one unfavorable area without making runways and shelters. Heavy mortality, partly from paratyphoid, occurred in winter--500 out of 900 died. Mortality gradually decreased as animals moved about and adjusted to area. The epizootic did not spread to adjacent, more heavily populated pens in which nutria were well adjusted, although animals moved back and forth between pens. The epizootic is attributed to failure of newly introduced animals to adjust to area, which led to poor condition. In one study, more scats were found to have parasitic infection in an area where burrows were scarce than where they were numerous. An epizootic occurred in part of a pond where nutria destroyed vegetation. It ceased when animals moved to a better part of pond. Where vegetation was destroyed by nutria, predation by small carnivores commonly wiped out whole litters, especially when pond was drained. Predation losses were low where vegetation was good, even when pond was drained. Nutria, especially nursing females, were aggressive toward predators when in good habitat, and even killed predators. They were passive in open, destroyed habitat. A group of 200 young released in fall failed to make burrows or shelters and were subjected to heavy predation. Loss was nearly complete. A nearby population of adults made shelters and had few losses. Groups consisting only of males never made burrows or shelters. Nutria killed many of their young when crowded into restricted area of a drained pond. Much strife also occurred when newly independent young began using food boxes; it ceased when young learned their place in dominance system. In general, author wishes to stress (1) the lack of any direct relationship between population level and mortality, (2) the fact that disorganization of a population by introduction of many new individuals favored an epizootic, and (3) that social and environmental conditions were more important than actual population levels in determining effects of mortality factors.

Flaim, Francis Richard. THE OSTEOLOGY AND MYOLOGY OF THE PELVIC AND PECTORAL GIRDLES AND APPENDAGES OF THE MAMMALIAN GENUS ONDATRA, (MUSKRAT), WITH COMPARATIVE NOTES ON NEOTOMA (WOOD RAT). Ph.D. thesis, Stanford U. 320 p. 1956. [From abstract in Dissertation Abstracts 16(10).]

Johnston, James W., Jr. NOTES ON A NORTH DAKOTA MUSKRAT COMMUNITY. Proc. N. Dak. Acad. Sci. 2: 55-56. 1949. [From Biol. Abs. 31(1).]
Note on population sampling.

FUR ANIMALS, GENERAL

Anon. RABBIT FURBEARER "KING" FOR 1956-57 SEASON. S. Dak. Cons. Digest 24 (6): 6-7. June 1957.

The white-tailed jackrabbit was the leading furbearer of S. Dak. in the drought year of 1956. Dealers reported buying about 1.5 million of them at av. price of 73¢. Some 8,500 black-tailed jackrabbits brought an av. price of only 23¢. Pelts of jackrabbits are coverted to felt. Carcasses are processed into food for ranch mink. At 10¢ a pound, jackrabbits were bringing more than hen chickens, which were selling for 8¢ a pound. Fur dealers urged that jackrabbits be shot only Nov. 15 through Feb., when pelts prime. Second ranking fur animal was mink, with 13,512 bringing av. price of $19.61. Muskrats were low and only 11,220 were reported sold. Also representing poor water conditions, only 483 beaver pelts were reported; their av. price was only $4.81. Raccoons remained numerous and 12,936 pelts were reported, with av. price of $2.20. Other pelts reported were 2,939 weasels (av. price 96¢), 7,430 skunks (83¢), and 2,020 spotted skunks (80¢).

FUR ANIMALS, GENERAL--Continued

Ashbrook, Frank G., and Stanley P. Young, compilers. FUR CATCH IN THE UNITED STATES, 1956. US F&WS, Wildl. Leafl. 388. 3 p. June 1957.
A 2-page table presents figures on take of each fur species in each state. Data are given as reported by states and hence are not wholly comparable; some states made no report, some reported only fur-buyers' reports, some reported only for certain species, and some made good estimates for all species. A page of text discusses the general situation and points out that there was a general decline in the fur catch owing to the poor market for most types of fur.

Pollack, Bill. (Mass. Div. Game.) [TRAPPING AND TRAPPERS ON THE WAY OUT IN MASSACHUSETTS?] Mass. Wildl. 8(3): 17. May-June 1957.
Trapping and trappers appear to be on the way out in Mass. As recently as 1946 the state sold 4,171 trapping licenses to residents; in 1956 only 1,253 were sold. Low pelt prices are the probable cause. Professional trappers no longer exist in Mass. Today's trapper is a part-timer, who sets an av. of only 48 traps. His av. gross income from trapping during the period 1949-51 was only $113 per year.

BEARS

Bailey, Wayne. (W. Va. Cons. Comm.) BLACK BEAR...GOING! GOING! GONE! W. Va. Cons. 21(4): 18, 1 photo. June 1957.
Kill in W. Va. reached all-time low of 48 in 1956, down 43% from 1955. Hunting pressure remained at the level of recent years. Game authorities of Va. and W. Va. are alarmed about the status of bears. A model bear law failed to pass in the W. Va. legislature. There seems to be little public support for conservation of bears in W. Va.

Murie, Olaus J. (Moose, Wyo.) THE GRIZZLY BEAR & THE WILDERNESS. Animal Kingdom 60(3): 68-73, 6 photos. May-June 1957.
Notes on behavior of grizzlies and notes on foods of grizzly, fox, lynx, and wolf in Brooks Range of Alaska. Grizzlies are largely herbivorous, but eat caribou killed by wolves. Foxes and lynxes also eat wolf kills. The predation on caribou is desirable in the region because the lichen range is poor and is supporting all the caribou it should.

RACCOON, RINGTAIL, COATI

Ingles, Lloyd G. (State Coll., Fresno, Calif.) OBSERVATIONS ON BEHAVIOR OF THE COATIMUNDI. J. Mamm. 38(2): 263-264, 1 photo. May 1957.
Arboreal behavior; preparation of dangerous arthropods for eating by rolling between paws.

Thackray, Richard Irving. STUDIES OF EXTERNALLY-AROUSED DRIVES IN THE RACCOON. Ph.D. thesis, Purdue U. 87 p. 1956. [From abstract in Dissertation Abstracts 17(4).]
Experimental study of ability of captive raccoons to learn a simple position response when motivated by availability of objects they could manipulate.

MUSTELIDS

Andrews, Bruce J. (Mich. Dept. Cons.) MARTEN FROM CANADA. Mich. Cons. 26 (3): 18-21, 3 photos. May-June 1957.
Account of trapping marten in Ont. for attempted restoration in n. Mich.

Geagan, Bill. RETURN OF THE FISHER. Nat. Mag. 50(6): 322-323, 2 figs. June-July 1957.
Popular but informative article on habits and recent increase of fisher in the NE. Based largely on work of Coulter, Hamilton, de Vos and others.

Hagmeier, Edwin M. (U. of New Brunswick, Fredericton.) DISTRIBUTION OF MARTEN AND FISHER IN NORTH AMERICA. Can. Field-Nat. 70(4): 149-168, 2 maps. Oct.-Dec. 1956 [June 1957].

Distribution of both species is discussed by states, provinces, and territories. Results are embodied in 2 maps that show maximum known ranges. Opinions of various authors on factors governing distribution of these animals are reviewed. List of about 250 references.

Hawley, Vernon D., and Fletcher E. Newby. (Mont. Game Dept.) MARTEN HOME RANGES AND POPULATION FLUCTUATIONS. J. Mamm. 38(2): 174-184, 1 map. May 1957.

From summary: Marten were live trapped on a 6 sq. mi. study area in Glacier Natl. Park, Mont., for 2.5 years. Ranges of 6 males and 5 females were enclosed in the area. Minimum size of home range av. 0.92 sq. mi. for males and 0.27 for females, far less than indicated by other studies. Ranges of adult marten of same sex tended to overlap but little. Residents tended to remain on their ranges for as long as 819 days. No seasonal movements were noted. Some range boundaries coincided with vegetational or topographic features. Population increased from 23 in summer of 1953 to 27 in winter of 1954, and then declined to 14 in fall of 1954. Young and females were involved in most of the decline. Three young males were known to have dispersed. Decline of marten was preceded by decrease in mice, which suggests that the decline was a matter of overpopulation with food as limiting factor.

BIG GAME, GENERAL

Altmann, Margaret. (Jackson Hole Res. Sta., Moran, Wyo.) LIFE WITH MOTHER. Animal Kingdom 60(3): 79-80, 1 photo. May-June 1957.

Account of parental care by moose.

Banfield, A. W. F. (Can. Wildl. Serv., Ottawa.) THE PLIGHT OF THE BARREN-GROUND CARIBOU. Oryx (J. Fauna Pres. Soc., London) 4(1): 5-20, 4 maps, 3 photos. Apr. 1957.

A semipopular summary of knowledge of this caribou, with much information from Banfield's own extensive studies (see WR 79: 27; 81: 33; and 86: 48). Among topics reviewed here are habits, behavior, migrations, shrinkage of range, importance to man, decrease of population as revealed by recent surveys, wastefulness of slaughter by natives, and need of inculcating some management concept in the natives. The paper contains little if any new information, but it provides a good digest of findings to date.

Barnicoat, C. R. (Massey Agr. Coll., Palmerston North, N. Z.) WEAR IN SHEEP'S TEETH. N. Z. J. Sci. & Tech., Sec. A, 38(6): 583-632, 17 figs. Apr. 1957.

Dr. Thane Riney states in a letter that this paper, plus that of Robinette, Jones, Rogers, and Gashwiler (J. Wildl. Mgt. 21(2): 134-153), should result in a marked change in practices associated with aging deer by rate of wear of molars. The problem of why incisor teeth of sheep in parts of N. Z. have deteriorated in recent years was investigated intensively. Wear was strongly increased by overgrazing on all types of country, by feeding on tough vegetation, and to some extent by congenital differences and amount of abrasive soil material in food. Also important was erosive effect of compounds of organic acids, which were prominent in improved, high-yielding pastures of European type. Factors that were not found to be important in amount of tooth wear were chemical composition of teeth and mineral and vitamin nutrition. Soil type was significant only indirectly--through type of forage and degree of stocking. Heavy precipitation, especially in summer, increased softness and succulence of grasses and weeds and thereby retarded tooth wear. Fertilization of pastures was associated with tooth wear only through its effect in upgrading pastures and thereby increasing chemical erosion of teeth.

Bassett, Neil R. (Shiloh Natl. Military Park, Pittsburg Landing, Tenn.) LORD OF THE TETONS--THE SHIRAS MOOSE. Minn. Nat. 8(2): 77-80, 2 figs. 1957.
Semipopular article based on research in Jackson Hole, Wyo. It deals with numbers, physical characteristics, winter foods, seasonal movements, social domination by other big-game species, diel activities, winter activities, and mortality factors. Some parts of the range are overbrowsed. A limited amount of either-sex hunting is allowed to control the herd, the portion of which in Grand Teton Natl. Park is about 300 individuals. Too many are shot because of confusion of moose with elk.

Benson, W. Arthur. (Dept. Nat. Resources, Regina, Sask.) A GENERAL VIEW OF THE ANTELOPE IN SASKATCHEWAN. Can. Wildl. Serv., Wildl. Mgt. Papers Delivered at 20th Fed.-Prov. Wildl. Conf., 1956. p. 23-34, 1 map. 1957.
Discusses management, ranges, and habitats of Sask. herds. Pronghorns go through or under barbed-wire fences, but Sask. herds are separated effectively by paige-wire fences along railways. Ranges and habitats of the major Sask. herds are described. Conditions for pronghorns have improved with conversion of much cropland to pasture and with pasture improvement. Inventory is now made by plane and actual population estimates are made. Sask. population is now about 15,000, and since kill was only 2,025 in 1955, management experiments can be made safely. Seasons have been closed completely after various severe winters. Increase was rapid in 1950-51. In 1952 it was decided to try a buck-only law with the idea of allowing population to reach carrying capacity of 30,000. The unbalanced sex ratio upset breeding behavior. Result was staggered fawning seasons. This might be advantageous in preventing large fawn losses in inclement spring weather. However, it became apparent that Sask. did not have enough antelope hunters to control a herd of 30,000, so the buck law was abandoned after 2 years. Author also discusses present regulations and use made of checking stations.

Choquette, L. P. E., L. K. Whitten, G. Rankin, and C. M. Seal. (Inst. Parasit., McGill U., Macdonald Coll. P. O., Quebec.) NOTE ON PARASITES FOUND IN REINDEER (RANGIFER TARANDUS) IN CANADA. Can. J. Comp. Med. & Vet. Sci. 21 (6): 199-203. June 1957.
Based on examination of 166 reindeer near Aklavik, N. W. T. 46.4% had larval tapeworms. Cysticercus tarandi was found in 12.8%, C. temuicollis in 25.5%, and hydatid cyst in 9.5%. Probable role of wolf and dog in these infections is discussed. Ostertagia trifurcata was found in 23 of 24 reindeer, but this worm was not numerous. Warble fly larvae (Oedemagena tarandi) were also noted.

Denver Wildlife Research Laboratory. BIG GAME INVENTORY FOR 1955. US F&WS, Wildl. Leafl. 387. 4 p. June 1957.
Kill and inventory figures are tabulated as reported by each state. Turkey and 4 kinds of exotic big game are included. As usual, there are marked inconsistencies in whether or not national park and refuge populations are included in a state's estimates. Also, various new populations and semiwild species are not included.

Jones, Fred L., Glenn Flittner, and Richard Gard. (Calif. Dept. Game.) REPORT ON A SURVEY OF BIGHORN SHEEP IN THE SANTA ROSA MOUNTAINS, RIVERSIDE COUNTY. Calif. Fish & Game 43(3): 179-191, 3 figs. July 1957.
Survey was made in July 1953 and additional data were gathered through 1955. The herd is estimated to consist of at least 350 individuals. Main range is on lower slopes, below 4,000 ft. Ratio of rams to ewes was 109:100; of lambs to ewes 18:100; of yearlings to ewes 27:100. Horns of 2/3 rams had at least 3/4 curl. Some poaching is known to occur. Chief limiting factor is thought be be availability of water. Provision of water holes led to use of new areas. Forage plants near water were heavily utilized. Many food plants are listed with indication of their importance. A little information is given on parasites and on predatory and competing animals that are present on the range.

Kelsall, John P. (Can. Wildl. Serv.) CONTINUED BARREN-GROUND CARIBOU STUDIES. Canadian Wildl. Serv., Wildl. Mgt. Bul., Ser. 1, no. 12. iii + 148 p., 29 figs., 12 maps. Feb. 1957.

Detailed research report on continuation of Banfield's work. Based on 3 years of study and 65,000 mi. of travel over much of the District of Mackenzie, NWT. Effort was concentrated on 4 herds that varied in size and economic status. Data were obtained on ranges, migrations, populations, kills by man, and annual increment. Much information is also given on travels related to calving, nature of calving areas, measurements and growth of young, behavior of cows and calves, senses, behavior in relation to wolves, and predation. Range studies, based on transects, are reported at length. Age determination methods were considered unsatisfactory. Herds were found to be far from discrete; there was much overlapping on both summer and winter ranges. Counting newly-studied coastal herds, total population of study area was about 50,000 larger than estimated by Banfield, although some populations were estimated as smaller. Current kills by man apparently were not excessive, according to calculations. Reproductive success seemed to be similar over large areas in any given year and was relatively poor during study. An important reason appeared to be cold wet weather at calving time; this led to much travel by herds and heavy losses of young. Biting insects may also have contributed to calf losses. Predation probably was not serious. Analyses indicated relatively light wolf predation. Wolf populations were estimated at only about 8,000 in the huge study area—a much lower estimate than made by previous workers. Importance of lichen range was confirmed. Fires have seriously injured large proportions of the range and are becoming commoner. Their effects may last well over 100 years. General fire protection is impossible. Few areas of really good range remain, however, and protection of these from fire might be practical. This long, detailed paper has 18 tables and many figures, but its lack of a summary is highly regrettable.

Kimball, Thomas L. (Colo. Game Dept.) THE ECONOMIC ASPECTS OF LIVESTOCK-BIG GAME RELATIONSHIPS AS VIEWED BY A GAME ADMINISTRATOR. J. Range Mgt. 10(2): 67-70. Mar. 1957.

Rebuttal to Chilson (see WR 82: 21), who argued strongly that game was overly favored on the range. Kimball also makes a strong case. Ranchers do spend a lot to improve public range, but they benefit from heavy spending by game and other public agencies for the same purpose. Management and harvest of livestock is more efficient, but management of game has improved greatly. While 2457 people graze stock on national forest land in Colo., 532,000 people hunt and/or fish and spend more than $80,000,000 a year in so doing. Cost of grazing permits is only a small part of actual value. Federal agencies pay 25% of all receipts in lieu of taxes and sportsmen pay a wide variety of taxes. We really do not know that livestock is more efficient than game in utilizing forage, but this question is academic, for when a range is properly managed for soil and water conservation, forage utilization is low enough that no game-livestock competition exists. Need for more livestock at present is doubtful, in view of surpluses. Kimball believes that recent increases of the deer family are attributable more to shift of grass ranges to browse ranges than to deer getting more than their share of cattle forage; the exception is where overstocking has prevailed. At present, national forest ranges in Colo. still have 4 cattle to each elk and 2 sheep to each deer. It is not correct to assume that rising game populations have been cause of reductions in livestock permits; range capacity for livestock was grossly overestimated to begin with.

Knipe, Theodore. (Ariz. Game Dept.) THE JAVELINA IN ARIZONA / A RESEARCH AND MANAGEMENT STUDY. Ariz. Game & Fish Dept., Wildl. Bul. no. 2. vi + 96 p. + folding end map; 16 photos, 6 maps, & several drawings in text. No date [1957].

Important, interesting, and well-printed bulletin. It takes up weights and measurements (chiefly averages), past and present distribution, habitats, water relationships, senses, social and other habits, longevity of captives, hunting results, and topics mentioned below. Herds av. 8-9 but may be much larger. Ferocity is much overrated, but the animals are of uncertain disposition. Musk gland may help keep herds together. Cruising radius of a herd is normally less than 3 miles. There are no seasonal migrations. Litters are usually of 1 or

2; they are born in any month, with peak in summer and fall. Habitat is now less restricted than in early days. Sex ratio is about equal. Ratio of adult to young is 1:0.36. Main limiting factors, in order of importance, are legal kill, illegal kill, and predators. Poisoning, by 1080 or otherwise, was not demonstrated. Javelinas are among the least bad of native or domestic animals in polluting water holes. They rarely eat meat in any form; accusations of being predatory are largely unfounded. Cacti are the major food, but roots, fruits, greens, acorns and many other foods are eaten. Rooting is done extensively but rarely damages range. There is some competition with livestock on desert-shrub ranges, and with game on various ranges. Javelinas should be discouraged on turkey ranges. Javelinas have great interest-appeal and much economic value. Number in state probably is over 18,000. Kill is about 3,000 annually. Some decrease may be appearing, but population is far greater than before 1930. About 30% of landowners consider the animal deleterious. Present hunting seasons are about right. More law enforcement and public relations work is needed. Special surveys and more research are required. Local control may be needed; in this, numbers should be cut to an av. of no more than 10 per herd. The paper has a good summary and a bibliography of 42 titles, some of which are popular or paleontological. Most regrettably, the only other javelina management monograph, "The Collared Peccary in Texas," 1953, (see WR 76: 47), is not listed or quoted.

Koford, Carl B. (MVZ, U. Calif., Berkeley.) THE VICUÑA AND THE PUNA. Ecol. Monog. 27(2): 153-219, 19 figs. Apr. 1957.

A notable and readable account of the status, ecology, life history, and behavior of that little camel, the vicuña, in the Andean highlands. The paper should be of high value to anyone interested in the species, in the sociology of wild animals, or in conservation in S. Am. Major sections of the paper are: Distribution, population, and mortality; General activities and reactions; Feeding, drinking, and bathing; Pregnancy, birth, and infancy; Family bands; Male troops; Territorial and inter-group relations; Relations with other vertebrates; Hunting, utilization, and management. It is good to learn that the animal is still widely distributed and apparently surviving fairly well although far less common now than long ago. Koford believes the vicuña would respond admirably to game management measures and would amply repay the effort.

Mace, R. U. (Ore. Game Comm.) 1956 BIG GAME HARVEST. Ore. State Game Comm. Bul. 12(6): 3, 5-7. June 1957.

Detailed report on deer and elk kill, by counties, for both regular and special seasons. Total kill of deer was 119,741, highest in U. S. Total kill of elk was 5,014. Deer depredations continue and some overuse of range is apparent from 51% utilization of bitterbrush--a key species. Adequate control of deer will require more control over distribution of hunters.

McCabe, Robert A. (U. Wis.) OBSERVATIONS ON THE DISAPPEARANCE OF SHED CARIBOU ANTLERS. J. Mamm. 38(2): 275-277. May 1957.

Cervid antlers are commonly consumed within a few years by the cervids themselves and by rodents.

Morris, Melvin S., and John E. Schwartz. (Mont. State U.) MULE DEER AND ELK FOOD HABITS ON THE NATIONAL BISON RANGE. J. Wildl. Mgt. 21(2): 189-193, 2 figs. Apr. 1957.

Stomach samples of mule deer and elk, secured at monthly intervals from Nov. 1951 to Nov. 1952, were analyzed. The study area was mainly Palouse Prairie grassland and Montane forest with plants representative of w. Mont. Contents of elk stomachs consisted mainly of grasses except during July, Aug., and Sept., when forbs made up 3.5, 10.0 and 32.5% respectively. Traces of shrubs and conifers were eaten most months. Mule deer used grass Nov.-April, except that Jan. samples consisted mainly of Douglas-fir. Species used by elk followed general expectations for the type of range. Green basal herbage on grasses during late fall and winter, seasonal maturity of forbs, limited supply of deciduous shrubs, and inaccessibility of low growing herbage owing to snow depth and crust, all appeared to be associated with the seasonal variation in foods of mule deer.--Authors.

Progulske, Donald R. (S. Dak. State Coll., Brookings.) A COLLAR FOR IDENTIFICATION OF BIG GAME. J. Wildl. Mgt. 21(2): 251-252, 2 figs. Apr. 1957.
Describes and illustrates a leather collar to which patterns of colored plastic are cemented. Discusses use of this collar for recognition of individual deer.

Rousseau, Jacques. LE CARIBOU ET LE RENNE DANS LE QUÉBEC ARCTIQUE ET HÉMIARCTIQUE. Rev. Canadienne Géog. 4(3/4): 60-89. 1950. [From J. Mamm. 38 (2).]

Yegorov, O. V. THE ECOLOGY OF THE SIBERIAN MOUNTAIN GOAT (CAPRA SIBIRICA MEYER). Akad. Nauk SSSR, Trudy Zool. Inst. 17: 7-134. 1955. [From Biol. Abs. 31(4).]
In Russian.

Yoakum, James D. (P. O. Box 311, Corvallis, Ore.) FACTORS AFFECTING THE MORTALITY OF PRONGHORN ANTELOPE IN OREGON. Master's thesis, Ore. State Coll. 112 p. 1957.
A 3-year study was undertaken to collect and analyze data pertaining to factors influencing mortality of pronghorns in Ore. Forces noted to decrease herds included: congenital and parturition deaths, old age, illegal kills, legal kills, accidents, and severe winters. Evidence also indicated that disease, predation, and range conditions affected survival. 13 genera with 37 species of endoparasites and 3 genera with 5 species of ectoparasites are listed as known parasites of antelope in N. Am. An annotated list of some 14 diseases is also included. 370 pronghorn carcasses were classified as to sex and age, estimated season of death, and per cent mortality by age groups.--Author.

DEER (Odocoileus)

Anon. WEST VIRGINIA RETURNS TO STATEWIDE BUCKS-ONLY DEER SEASON. W. Va. Cons. 21(4): 13, 1 photo. June 1957.
W. Va. had an extremely enlightened either-sex system in operation. But for 1957 the Commission felt it necessary to return to bucks-only because of public sentiment as reflected in the legislature. This situation occurred despite the fact that the Commission has put out much good educational material on the subject. The Wildl. Mgt. Inst. (Outdoor News Bul. 11(11): 4) reports that 85% of sportsmen's groups favored the Commission's either-sex system but were not vocal before the legislature. As a result, opponents nearly got a county-option bill passed.

Ashcraft, Gordon, and Don Reese. (Calif. Dept. Game.) AN IMPROVED DEVICE FOR CAPTURING DEER. Calif. Fish & Game 43(3): 193-199, 5 figs. July 1957.
Describes the "Improved Deer Snare," a simple trap of almost no bulk and very low cost. Heavy rubber bands cut from truck tubes pull snare lines that catch deer by leg after deer walks against trip line. Bell attached to rope summons operator, who remains in vicinity tending a number of these snares. The snare can be adapted to almost any situation in which there are well-used deer trails. Several sets can be made by 1 man in a day. Chances of injury to deer are slight if snares are attended closely. Authors caught 62 deer in 35 days without injuring an animal. [The device has enormous potential in research, transplanting, and control on small unhunted areas.]

Bandy, P. J., W. D. Kitts, A. J. Wood, and I. McT. Cowan. (U. of B. C., Vancouver.) THE EFFECT OF AGE AND THE PLANE OF NUTRITION ON THE BLOOD CHEMISTRY OF THE COLUMBIAN BLACK-TAILED DEER (ODOCOILEUS HEMIONUS COLUMBIANUS) B. BLOOD GLUCOSE, NON-PROTEIN NITROGEN, TOTAL PLASMA PROTEIN, PLASMA ALBUMIN, GLOBULIN, AND FIBRINOGEN. Can. J. Zool. 35(2): 283-289. Apr. 1957.
The substances were studied in 2 series of animals reared on high and low planes of nutrition. Statistical data are given for each. Only blood sugar and fibrinogen were measurably lower in animals of low nutrition. Age changes were noted that were independent of nutritive state but were similar to those reported for domestic ruminants.

Bentley, Arthur. (Malvern, Victoria, Australia.) A BRIEF ACCOUNT OF THE DEER IN AUSTRALIA. J. Wildl. Mgt. 21(2): 221-225. Apr. 1957.

An account of introductions in the late 19th century and of present distribution of deer in Australia. Six species are now established: red deer (Cervus elaphus), fallow deer (Dama dama), hog deer (Axis porcinus), axis deer (Axis axis), sambar (Cervus unicolor), Moluccan rusa (C. timorensis moluccensis). Main concentrations are in e. and se. Australia. Minor crop and forest damage occurs. Natural enemies are negligible. Tables show hunting take by one hound pack and reproductive classification of some sambar taken in Victoria.--Author.

Bissell, Harold D., and Wm. C. Weir. (U. Calif., Berkeley.) THE DIGESTIBILITIES OF INTERIOR LIVE OAK AND CHAMISE BY DEER AND SHEEP. J. Animal Sci. 16(2): 476-480. May 1957.

Browman, Ludvig G., and Paul Hudson. (Mont. State U., Missoula.) OBSERVATIONS ON THE BEHAVIOR OF PENNED MULE DEER. J. Mamm. 38(2): 247-253. May 1957.

Local, wild-caught deer were observed during fall of 1955 in a corral at the Natl. Bison Range, Mont. The group consisted of 1 buck, 13 does, and 2 fawns. Notes are given on movement patterns in the corral, use of water, hours of feeding, cud chewing, bedding habits, social order, grooming by magpies, illness, and breeding behavior. All deer drank water, mostly early in morning, even when snow was on ground. Feeding was heaviest in early morning and late afternoon; it was affected markedly by weather. Cud was chewed when deer were bedded, less often when standing. Bedding was most frequent during middle of day. Individual deer had preferred bedding areas. The herd tended to bed as a group. A social or kick-order was evident.

Buechner, Helmut K. (State Coll. Wash., Pullman.) THREE ADDITIONAL RECORDS OF ANTLERED FEMALE DEER. J. Mamm. 38(2): 277-278. May 1957.

Crockford, Jack A., Frank A. Hayes, James H. Jenkins, and Seldon D. Feurt. (Ga. Game Comm.) NICOTINE SALICYLATE FOR CAPTURING DEER. J. Wildl. Mgt. 21 (2): 213-220, 5 figs. Apr. 1957.

An effective and practical method of capturing wild white-tailed deer by shooting with a drugged dart is described. Factors deemed to be essential characteristics of a drug for this use are listed, and air gun and darts are described. Nicotine salicylate appears to possess most of the qualities desired. A dosage of 300 mg. is recommended for deer weighing between 50 and 100 lbs. The capture of 14 wild and 3 penned deer is discussed, and the biphasic action of nicotine is illustrated. All deer survived the initial immobilization and no subsequent mortality owing to drug action was detected in 8 deer observed up to 4 mo. Hunting procedure and recommendations are outlined.--Authors.

Gill, John D. (Me. Dept. Game.) REVIEW OF DEER YARD MANAGEMENT 1956. Maine Dept. Inland Fisheries & Game, Game Div. Bul. no. 5. 1-61 p., illus. Mar. 1957.

A valuable and important contribution, the best single reference on deer yards and their management. Gill has combined data from many references (102 of which are cited) with detailed information on conditions in Maine. Major sections of his paper are: Yarding behavior of deer, Food habits and nutrition, Characteristics of some important trees and shrubs, Carrying capacities of deer yards, Forest ownership in Maine, Techniques for deer yard management, and The deer yard management problem in Maine. Conclusions are drawn throughout the paper. The author's approach is practical and realistic, with due recognition of what game departments and forest owners are not likely to be able to do in management in and around yards. Complexities of the problem are not minimized and research needs are indicated. In all, the paper seems to be an excellent summary of what is known of deer yards and their management and a fine guide to further operations and research.

Glasgow, Leslie L., and Allan Ensminger. (La. State U.) A MARSH DEER "DIE-OFF" IN LOUISIANA. J. Wildl. Mgt. 21(2): 245-247. Apr. 1957.

Summary: "A study was made of marsh deer mortality in south-central Louisiana in 1953 and 1954. Strong southerly winds inundated the deer range with saline Gulf water in 1952 at a time of severe prolonged drouth. The salt water and drouth eliminated practically all the succulent fresh marsh vegetation on which deer relied for food. This vegetation remained in a stagnant condition through 1953 and 1954. The death of adult male deer in 1953 was followed by the death of additional males plus does and fawns in 1954. Twenty-four dead deer were examined in the field, and nine weakened animals were autopsied in the Veterinary Science Department at Louisiana State University. Disease symptoms were lacking, but symptoms of starvation were very evident. Because of the lack of nutritious range plants, it is believed the 'die-off' was due to malnutrition."

Haugen, Arnold O. (Iowa State Coll.) ANTLERS AWAY! Ala. Cons. 28(5): 14-16, 16 photos. Apr.-May 1957.

Well-illustrated account of development and shedding of antlers by a whitetail buck over a 6-year period.

Hayes, F. A., J. H. Jenkins, S. D. Feurt, and J. A. Crockford. (U. Ga., Athens.) OBSERVATIONS ON THE USE OF NICOTINE FOR IMMOBILIZING SEMIWILD GOATS. J. Am. Vet. Med. Assn. 130(11): 479-482, 6 photos. June 1, 1957.

Reports experiments made on goats in course of developing the method of capturing deer by shooting with darts carrying nicotine salicylate. See Crockford et al., this issue WR.

Johnson, Skip. TOO MANY DEER AND A FIVE-MILE FENCE. W. Va. Cons. 21(4): 19-20, 3 photos. June 1957.

A W. Va. apple company lost over 2,000 young apple trees in 1 year because of deer damage. It felt compelled to erect 5 miles of fence and is putting in 3 more miles. The fence is 7 feet high. It failed to stop deer when strands were 11 inches apart, and now that strands are 8 inches apart a few deer jump it. The fence was decided upon after a deer-repellent spray was effective for only about 3 weeks. Deer food is said to be scarce outside the orchards.

Klein, David R. (US F&WS, Petersburg, Alaska.) THE BLACK-TAILED DEER IN ALASKA / AN OUTLINE OF MANAGEMENT METHODS. US F&WS, Fed. Aid, Petersburg, Alaska, Wildl. Mgt. Ser. no. 1. 13 unnumbered p., 7 figs., proc. Mar. 1957.

Popular pamphlet that explains relation of population to food supply and need of studying population and regulating it by hunting to avoid excessive winter kill. Provides data for se. Alaska on habitat conditions, population fluctuations, age classes of deer bagged 1953-56, and hunting statistics for 1956.

Lang, E. M. DEER OF NEW MEXICO. N. M. Dept. Game & Fish, Bul. no. 5. v + 41 p., 24 figs. 1957.

A good extension-type booklet. Two races of mule deer and two of whitetail deer occur in N. M. Much of the booklet consists of descriptions of these deer and discussions of their distributions, habitats, breeding seasons, food habits, weights, and life spans. Of the 4 races, only the Texas whitetail is in trouble; it is scarce and local. Other sections of the paper explain the need of keeping deer in balance with their food supply, report numbers harvested each year since 1937, and tell how to field-dress a deer. The present population of deer of all kinds is about 300,000. Kill has increased almost steadily and is now about 35,000 a year; the goal is 50,000. As elsewhere, one of the main problems is to obtain a suitably large kill. In many areas, the herd has reached range capacity.

Leach, Howard R., and Jack L. Hiehle. (Calif. Dept. Game.) FOOD HABITS OF THE TEHAMA DEER HERD. Calif. Fish & Game 43(3): 161-178, 8 figs. July 1957.

This herd of blacktails in n. cent. Calif. moves between summer and winter ranges. "The stomach analyses of 96 deer collected on the winter range reveal a seasonal utilization of food plants as influenced by the changes in range forage composition. Browse (buck brush, mountain mahogany, manzanita, scrub

oak, silktassel, and many deciduous browses) appear to constitute the staple item of diet throughout the winter. The leafage and acorns of the deciduous oaks contribute heavily to the early fall diet, and as the foothills 'green up' with the advent of fall rains, the deer graze heavily on the annual grasses and forbs. This annual forage production reaches its height in March, when it contributes most to the diet of the deer. Early in April the browse plants begin to leaf out with new growth and the deer appear to switch entirely to a browse diet. The summer food habits of the Tehama deer herd are represented by 37 deer stomach analyses. The preferred browse species consist of mountain whitethorn, squaw carpet, greenleaf manzanita, western service berry, and snowbrush."

McEwen, Lowell Clayton. DIETARY REQUIREMENTS OF MALE WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS) FOR BODY GROWTH AND ANTLER GROWTH. Ph.D. thesis, Pa. State U. 209 p. 1956. [From long abstract in Dissertation Abstracts 17(2).]
See also French, McEwen, et al., J. Wildl. Mgt. 20(3): 221-232, July 1956.

Robb, Dunbar. (Mo. Cons. Comm.) TWO DECADES OF DEER. Mo. Cons. 18(6): 1-3, 5 figs. June 1957.
Mo. is ringing down the curtain on its deer redistribution program. There are now deer in nearly all parts of the state and the program is no longer needed. This paper tells of the policies and practices under which the work was done and about the results. In the fall of 1956, 63 counties were open to deer hunting and some 8,000 deer were shot—well over twice the number of deer that existed in the state when the program began. Emphasis is now on redistribution of turkeys from refuge areas that are managed especially for them.

Robinette, W. Leslie, Dale A. Jones, Glenn Rogers, and Jay S. Gashwiler. (444 Federal Bldg., Salt Lake City, Utah.) NOTES ON TOOTH DEVELOPMENT AND WEAR FOR ROCKY MOUNTAIN MULE DEER. J. Wildl. Mgt. 21(2): 134-153, 4 pl., 4 figs. Apr. 1957.
Photographs of cheek teeth of known-age mule deer are given for the following ages: 4 mos., 6.5 mos., 1 yr. 4 mos., 1 yr. 7 mos., 1 yr. 10 mos., 2 yrs. 4 mos., 3 yrs. 4 mos., 4 yrs. 4 mos., 5 yrs. 4 mos., 8 yrs. 3 mos., 9 yrs. 4 mos., and 10 yrs. 6 mos. Materials for study included mandibles from 105 known-age deer--most of which had been caught and ear tagged shortly after birth—supplemented by hundreds of mandibles of untagged deer taken in various months. Milk incisiform teeth are through the gums at birth. The first pair of permanent incisors appears at 12 mos. The remaining incisiform teeth erupt in succeeding 6 mos. Milk premolars erupt within a week or 2 after birth and are shed at about 24 mos.; permanent premolars are fully erupted by the following mo. The first molar erupts at 3 mos. and is fully erupted at 12 mos.; M_2 first erupts at 10 mos. and is fully erupted at 20 mos.; M_3 erupts first at 16 mos. and fully at 28 mos. Aging thereafter is best done from amount of wear on molariform teeth. Authors express wear as a ratio between sum of widths of buccal crests of molars and sum of heights of corresponding lingual crests. Considerable variation in time of tooth eruption and/or degree of wear exists in deer of same age. Factors that can be responsible are: inherent differences, nutrition and character of forage, disease such as fluorosis, and amount of abrasive material ingested. Despite these difficulties, the authors believe that aging criteria developed for the region should permit fairly accurate age-structure determinations for hunter-killed deer if large samples are available, for errors in aging of individuals should tend to compensate.--W. L. Robinette.

Taber, Richard D., and Raymond F. Dasmann. (Mont. State U.) THE DYNAMICS OF THREE NATURAL POPULATIONS OF THE DEER ODOCOILEUS HEMIONUS COLUMBIANUS. Ecology 38(2): 233-246, 2 graphs. Apr. 1957.
From summary: Deer were studied in 3 man-modified portions of chaparral association of N. Coast Range of Calif. "Chaparral is a densely-growing association of shrubs; shrubland is a shrub-herb interspersion; wildfire burn is chaparral recently burned, where the shrubs are sprouting from the root-crown. These [deer] populations were compared for stability, density, structure, reproduction, mortality and movement. The principal causes of mortality were hunting (adult bucks) and starvation (other classes). The details of population gain and loss through one typical year (four years for wildfire burn) were reconstructed from these data... Populations in chaparral and shrubland were rela-

tively stable, so life tables were prepared for them, the sexes being treated separately. The population on the wildfire burn was unstable, high at first due to influx and then dropping rapidly due to egress, increased mortality and decreased reproduction. Sex-specific life tables for the deer of chaparral and shrubland were compared with those for: a hunted red-deer population on a fully-stocked island; a hunted roe-deer population from which there was a heavy emigration; and an unhunted Dall sheep population under heavy predation by wolves... On fully-stocked ranges there is an inverse relationship between production of young and survival of breeding adults, due presumably to competition for food between young and adults. When young (or senescent) are removed, by predation or emigration, the chances for survival of breeding adults appear to be improved. The differences in dynamics between these various populations of different species, are apparently due more to environment than to heredity."

Toth, S. J., P. D. McLain, and L. G. McNamara. (Rutgers U.) TEST RYE FOR DEER FORAGE. N. J. Agr. 39(2): 3-4, 1 photo. Mar.-Apr. 1957.

Rye is important late winter and early spring forage for deer at a public hunting area in Ocean Co., N. J. Deer strongly preferred spring-fertilized plots to fall-fertilized plots. When small spring-fertilized plots were placed in large rye fields, deer took all forage they could find from the plots and used surrounding areas to a limited extent. The spring-fertilized plots were richer in protein, total nitrogen, phosphorus, and potassium. Among spring-fertilized plots, deer preferred those that had received much nitrate of soda. Grazing on the highest nitrate of soda plot was so heavy that the rye never did recover to produce grain. Tests indicated that sodium content was not the factor influencing choice by deer.

Wedman, E. E., and Fred C. Driver. (US Dept. Agr., Anim. Dis. Branch, St. Paul, Minn.) LEPTOSPIROSIS AND BRUCELLOSIS TITERS IN DEER BLOOD. J. Am. Vet. Med. Assn. 130(12): 513-514. June 15, 1957.

187 blood samples from deer in Minn. were tested. 16% showed some degree of reaction to leptospira pomona. Two samples showed cross reactions with L. icterohemorrhagiae antigen. No correlation with age, sex, or locality was noted. Only 1 sample was positive for brucellosis, and in it the titer was low, so it is doubtful that active Brucella infection existed in any of the deer represented.

Wilkins, Bruce T. (Mont. Game Dept., Stanford.) RANGE USE, FOOD HABITS, AND AGRICULTURAL RELATIONSHIPS OF THE MULE DEER, BRIDGER MOUNTAINS, MONTANA. J. Wildl. Mgt. 21(2): 159-169, 3 figs. Apr. 1957.

A study of the range use and food habits of the Rocky Mountain mule deer was made in 1955-56 on a 6.5 sq. mi. study area. The area's general vegetative types are described. Observations of deer provided information on intraseasonal and interseasonal differences in use of the vegetative types. Food habits were determined by rumen analysis, direct observations of feeding deer, and evidence of plant use. Deer damage to alfalfa haystacks and occurrence of deer in alfalfa fields was noted. Characteristics of haystacks and fields which seemingly affected degree of use are discussed. Recent hunting seasons and their apparent results are discussed.—Author.

MAMMALS--MARINE

Berdegue, Julio. LA FOCA FINA, EL ELEFANTE MARINO Y LA BALLENA GRIS EN BAJA CALIFORNIA, Y EL PROBLEMA DE SU CONSERVACION. Inst. Mex. de Recursos Naturales Renovables, A. C. (Mexico 11, D. F.), Folleto 14. 1-38 p., 4 photos, 1 map. 1956.

Chapskii, K. K. A REVIEW OF THE SYSTEMATICS AND DIAGNOSTIC CHARACTERS OF SEALS OF THE SUBFAMILY PHOCINAE. Akad. Nauk SSSR, Trudy Zool. Inst. 17: 160-199. 1955. [From Biol. Abs. 31(4).]

In Russian.

Clarke, Robert. THE BIOLOGY OF SPERM WHALES CAPTURED IN THE AZORES. Norsk Hvalfangst-Tidende 45(8): 439-444. Aug. 1956. [From J. Mamm. 38(2).]

Dawbin, W. H. WHALE MARKING IN SOUTH PACIFIC WATERS. Norsk Hvalfangst-Tidende 45(9): 485-508, illus. Sept. 1956. [From J. Mamm. 38(2).]

Griffin, Donald R. (Harvard U.) HEARING AND ACOUSTIC ORIENTATION IN MARINE ANIMALS. Papers in Marine Biology and Oceanography, Suppl. to Vol. 3 of Deep-Sea Res., p. 406-417. 1955. [From author's abstract in Sport Fishery Abs. 2(2).]

Cetaceans and fishes have been shown to have good hearing. Data on this are discussed. Probable occurrence and mechanics of echolocation are also discussed.

Hewer, H. R. (Imperial Coll., London, Eng.) A HEBRIDEAN BREEDING COLONY OF GREY SEALS, HALICHOERUS GRYPUS (FAB.), WITH COMPARATIVE NOTES ON THE GREY SEALS OF RAMSEY ISLAND, PEMBROKESHIRE. Proc. Zool. Soc. London 128(1): 23-66, 13 figs., 2 pls. Feb. 1957.

Summary: "An account is given of the various phases of breeding behaviour of both cows and bulls on the island of Shillay, Outer Hebrides. Attention is drawn to unique features of combat between the bulls both before and after taking up territorial positions. The influence of the terrain available upon the behaviour of the seals of all ages is emphasised and comparisons made with other Scottish and Welsh colonies. An attempt is made to draw up a Life-table compatible with the known vital statistics. The more serious gaps in our knowledge of the population dynamics of this species are noted."

Johnson, A. L. SEAL MIGRATION. Nature in Wales 2: 267-270. 1956. [From J. Anim. Ecol. 26(1).]

"Based on recent work in west Wales on the recovery of ringed grey seals."

Laws, R. M., and P. E. Purves. THE EAR PLUG OF THE MYSTICETI AS AN INDICATION OF AGE WITH SPECIAL REFERENCE TO THE NORTH ATLANTIC FIN WHALE. Norsk Hvalfangst-Tidende 45(8): 413-425, illus. Aug. 1956. [From J. Mamm. 38(2).]

Mackintosh, N. A., and S. G. Brown. PRELIMINARY ESTIMATES OF THE SOUTHERN POPULATIONS OF THE LARGER BALEEN WHALES. Norsk Hvalfangst-Tidende 45(9): 469-480. Sept. 1956. [From J. Mamm. 38(2).]

Margolis, Leo. (Biol. Sta., Nanaimo, B. C.) PARASITIC HELMINTHS AND ARTHROPODS FROM PINNIPEDIA OF THE CANADIAN PACIFIC COAST. J. Fish. Res. Bd. Canada 13(4): 489-505, illus. 1956. [From Biol. Abs. 31(6).]

Moore, Joseph Curtis, and F. G. Wood, Jr. (Am. Mus. Nat. Hist., N. Y.) DIFFERENCES BETWEEN THE BEAKED WHALES MESOPLODON MIRUS AND MESOPLODON GERVAISI. Am. Mus. Novitates no. 1831. 1-25 p., 5 figs. June 1957.

Analysis of variation and value of differentiating characteristics, and compilation of distributional records.

Pike, C. Gordon. GUIDE TO THE WHALES, PORPOISES AND DOLPHINS OF THE NORTH-EAST PACIFIC AND ARCTIC WATERS OF CANADA AND ALASKA. Fisheries Res. Bd. Can., Biol. Sta. (Nanaimo, B. C.), Cir. no. 32 (Revised). iv + 14 p., illus. Aug. 1956.

Most of this little booklet consists of a drawing and an accompanying paragraph of description and general information for each species. One page carries 21 sketches of field characters of 7 species. The back cover provides form sheets for taking notes on sightings at sea or on individuals captured or found beached.

Tavolga, Margaret C., and Frank S. Essapian. (Am. Mus. Nat. Hist., N. Y.) THE BEHAVIOR OF THE BOTTLE-NOSED DOLPHIN (TURSIOPS TRUNCATUS): MATING, PREGNANCY, PARTURITION AND MOTHER-INFANT BEHAVIOR. Zoologica 42(1): 11-31, 3 pl. May 1957.

Van Bemmel, A. C. V. PLANNING A CENSUS OF THE HARBOUR SEAL (PHOCA VITULINA L.) ON THE COASTS OF THE NETHERLANDS. Beaufortia (Zool. Mus. Amsterdam) 5(54): 121-132. July 1956. [From J. Mamm. 38(2).]

MAMMALS--MARINE--Continued

Wilke, Ford. (US F&WS, 8923 236th SW, Edmunds, Wash.) FOOD OF SEA OTTERS AND HARBOR SEALS AT AMCHITKA ISLAND. J. Wildl. Mgt. 21(2): 241-242. Apr. 1957.

Five sea otters collected at Amchitka Island, Alaska, in March were found to be feeding on green sea urchin (86% by volume), fringed greenling (6%), mussel (5%), horse mussel (3%), and traces of starfish, hermit crab, and limpet. Seven harbor seals inhabiting the same waters and beaches were feeding on fringed greenling (96%), octopus (3%), and traces of unidentified fish, Alaska pollack, other Gadidae, and crabs. Octopus occurred in 5 of the 7 stomachs. The two littoral mammals are largely noncompetitive in their food habits.--Author.

Wilke, Ford, and Karl W. Kenyon. (US F&WS, 8923 236th SW., Edmunds, Wash.) THE FOOD OF FUR SEALS IN THE EASTERN BERING SEA. J. Wildl. Mgt. 21(2): 237-238. Apr. 1957.

In stomachs of 117 fur seals collected between Unimak Pass and Pribilof Islands in Bering Sea, capelin was dominant food near Aleutian Islands (52% of total food by volume). It was replaced offshore by squid and Alaska pollack, which there made up 47% of total food by volume. Salmon (which pass through this area in migration) and sand lance appeared once. Salmon, Alaska pollack, and sand fish were in 3 stomachs from St. Paul Island.--Ford Wilke.

BIRDS--GENERAL

Allen, Robert Porter. ON THE TRAIL OF VANISHING BIRDS. McGraw-Hill, N. Y. 251 p., illus. 1957. $4.50. [From reviews by R. T. Peterson and Monica de la Salle, Aud. Mag. 59(3).]

Famous for his fine monographs on the whooping crane, roseate spoonbill, and flamingo, Allen tells the interesting and exciting story of his life and experiences while making these and other important studies. "...a more entertaining and thrilling tale would be hard to find. Mr. Allen...has so thoroughly enjoyed his adventurous life, and tells of it with such gaiety and good humor, that the reader cannot help sharing his experiences and his chuckles over them."

Etchecopar, R. D., and F. Hüe. DONNÉES ÉCOLOGIQUES SUR L'AVIFAUNE DE LA ZONE DÉSERTIQUE ARABO-SAHARIENNE. In Arid Zone Research--VIII. Human and Animal Ecology / Reviews of Research. UNESCO, 19 ave. Kléber, Paris-16e, France. p. 138-163, 1 map. 1957.

In French; English summary. Rather short (12 p. of text) review paper that discusses effects of drought, heat, insolation, and wind on desert birds and then considers applicability of such biological principles as the "laws" of Gloger, Hesse, Allen, Bergman, Mayr, and Ripley. 61 references.

Murphy, Robert Cushman. JOHN JAMES AUDUBON (1785-1851): AN EVALUATION OF THE MAN AND HIS WORK. Reprinted from N. Y. Historical Soc. Quart., Oct. 1956. 35 p., illus. 50¢ from Natl. Aud. Soc., 1130 5th Ave., N. Y. 28, N. Y. [From review by Monica de la Salle, Aud. Mag. 59(3).]

Audubon's work has always been controversial, praised and criticized by artists and ornithologists. "It is therefore all the more interesting and significant to have the impartial opinion of such a prominent authority as Dr. Murphy. This little book considers with sympathy Audubon's life and accomplishments, clears up some misconceptions, and contributes to a more unified picture of his complex character."

Wing, Leonard W. NATURAL HISTORY OF BIRDS: A GUIDE TO ORNITHOLOGY. Ronald Press, 15 E. 26th St., N. Y. 10, N. Y. 539 p., 222 figs. 1956. $6.75. [From review by Herbert Friedmann, Am. Sci. 45(3).]

Written for use as text and for reading by amateurs of all levels. "The coverage of each subject is necessarily fairly brief, but, while uneven, reflects a very considerable amount of careful thought and discrimination in its preparation. Among the topics treated are classification, body structure, functions and adaptations, egg and embryonic development (the latter very sketchily treated), plumage and molt, factors of age and sex, biogeography, ecology, territory, social behavior, population dynamics, flight, migration, song, nesting, care of young, economic value, and others... A short chapter

on heredity in birds seems a little forced in its treatment, and another on health in wild birds is less satisfying than are most of the others." Most illustrations are good line drawings. "In addition to the literature lists after each chapter, there is an extensive bibliography (18 pages) at the end of the book, an appendix giving the orders and families of the birds of the world, a glossary of terms used, and a good index. The book should be useful to a large and varied audience, and ranks well among others of its kind." [The following is from a review by A. L. Rand, Natural History 66(3).] "At times Wing seems more preoccupied with statistics than with biology. His treatment of many subjects is remarkably incomplete. He often seems unsure of his data and there is much needless repetition. The errors are too numerous to excuse."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Bartholomew, George A., and Tom J. Cade. (U. Calif. at Los Angeles.) THE BODY TEMPERATURE OF THE AMERICAN KESTREL, FALCO SPARVERIUS. Wilson Bul. 69(2): 149-154, 2 graphs. June 1957.

Bartholomew, George A., Thomas R. Howell, and Tom J. Cade. (U. Calif., Los Angeles.) TORPIDITY IN THE WHITE-THROATED SWIFT, ANNA HUMMINGBIRD, AND POOR-WILL. Condor 59(3): 145-155, 8 graphs. May-June 1957.

Kramer, G., and Ursula von St. Paul. FURTHER STUDIES OF THE "WINTER EFFECT" ON HOMING OF PIGEONS. J. Ornith. 97(4): 353-370. 1956. [From Biol. Abs. 31 (4).]

In German. The same pigeon performed worse in winter than in summer when tested on the same short route. This "winter effect" occurred in birds on their first flight, and in respect to speed of homing. Evidence indicates that neither the changed appearance of the terrain, nor the inclination of the sun, nor the low temperature is responsible. The claim that the effect was correlated with the breeding season was examined, but the effect lasts through March after breeding has begun. It is concluded that the orientation for short distances in winter is not by visual means. Although the mechanism is unknown, it may be the same as the mechanism for distance orientation.--D. E. Davis.

Kramer, G., and Ursula von St. Paul. HOMING BY CAGED PIGEONS OVER SHORT DISTANCES. J. Ornith. 97(4): 371-376. 1956. [From Biol. Abs. 31(4).]

In German. Pigeons that had been raised and kept in a cage, performed better in homing when released at 22 km. than did birds not raised in cages when released in the winter. Caged birds released at 2.8 km. apparently used sight to find their way home.--D. E. Davis.

Marshall, A. J., and D. L. Serventy. (St. Bartholomew's Med. Coll., U. London, Eng.) ON THE POSTNUPTIAL REHABILITATION OF THE AVIAN TESTIS TUNIC. Emu 57(1): 59-63, 5 figs. Mar. 1957.

Miller, Loye. (MVZ, U. Calif., Berkeley.) SOME AVIAN FLYWAYS OF WESTERN AMERICA. Wilson Bul. 69(2): 164-169, 1 map. June 1957.

Summary: "Actual observations of moving birds through mountain passes in California and Arizona are put on record. These passes are discussed under two heads--fault lines and erosion gaps. It is postulated that altitude is an important factor in the bird's metabolic economy during migration. Hence it may determine the migration route."

Newman, Robert James. HOUR-TO-HOUR VARIATION IN THE VOLUME OF NOCTURNAL MIGRATION IN THE AUTUMN. Ph.D. thesis, La. State U. 202 p. 1956. [From long abstract in Dissertation Abstracts 17(3).]

Analysis of data from cooperative study of birds crossing moon.

Norris, Robert A. (1918 Hahn Ave., Aiken, S. C.) ON THE APPRAISAL OF FAT CONDITION IN BIRDS. Oriole 22(1): 2-9. Mar. 1957.

Relates McCabe's scale of fatness to actual, weighed amounts of subcutaneous fat. Total fat can be calculated from subcutaneous fat by formula. Norris discusses interpretation of data on fatness, and use of such data in study of migratory condition and other problems.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Precht, H. RESEARCH ON HOMING OF BIRDS. J. Ornith. 97(4): 377-383. 1956. [From Biol. Abs. 31(4).]
In German. By means of experiments with caged birds, it was concluded that at least some gulls can reach home without the use of known senses.--D. E. Davis.

Sauer, F., and E. Sauer. ZUR FRAGE DER NÄCHTLICHEN ZUGORIENTIERUNG VON GRASMÜCKEN. Revue Suisse de Zoologie 62: 250-259. 1955. [From abstract by H. C. M., Auk 74(2).]
"Blackcaps (Sylvia atricapilla) and Garden Warblers (S. borin) were tested for nocturnal migratory directional tendencies in a circular cage which screened off the environment below an angle of 68 degrees. Definite orientation was observed under clear or partly cloudly skies, even when the birds were raised from one day old in artificial light and arbitrarily selected day length. The birds showed positive phototropic response to the moon, bright meteorites, and directed artificial light. Complete disorientation occurred with full overcast, diffused light, and polarized light."

Wagner, H. O. (Übersee-Museum, Bremen, Germany.) VARIATION IN CLUTCH SIZE AT DIFFERENT LATITUDES. Auk 74(2): 243-250. Apr. 1957.
The small clutches common in tropical birds are discussed in relation to various factors, and with critical reference to theories of Lack.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Fletcher, A. J., and others. (Route 1, Denton, Md.) LIST OF CAROLINE COUNTY BIRDS. Md. Ornith. Soc., Md. Avifauna no. 1. 22 p. Dec. 1956. 25¢, paper, from Fletcher. [From review by Fred R. Scott, Raven 28(3/4).]
Annotated list for Caroline Co., Md. "...a fine example of what a local bird group can do if they put out a little effort."

BIRDS--POPULATIONS & FLUCTUATIONS

Blake, Charles H. (Lincoln, Mass.) DIFFERENTIAL CONTRIBUTIONS OF YEAR CLASSES. Bird-Banding 27(4): 171-174. Oct. 1956.
Illustrates 2 methods of estimating the contribution of a year-class to a bird population. The methods involve considerable banding and certain assumptions.

Bruns, Herbert. RESULTS OF AN ATTEMPT AT BIRD COLONIZATION IN A FRANKISH OAK-HORNBEAM WOOD. Ornithologische Mitteilungen 7(12): 221-227. 1955. [From long abstract by R. O. Bender, Bird-Banding 28(2).]
In German. 124 nest boxes of 4 types were placed in a 2-hectare plot of mixed woodland bordered by fields. "The astonishing number of successful nestings found in 1954 of 28.5 pair per hectare increased still further in 1955 to 46.5 successful nestings per hectare. Although it was not possible to determine the number of free-nesting pairs, the author estimated them to be of the order of 25 to 30 pair per hectare for a total nesting population of about 70 pair per hectare." Preferences of birds in type and location of boxes is discussed. "Although Bruns does not make the point, results such as these should give pause to those who assume that food supplies limit all small bird populations, or that competition for food is a dominant factor in species competition."

Kolb, Haven, Jr., editor. WINTER BIRD-POPULATION STUDY. Aud. Field Notes 11(3): 292-306. June 1957.
Report of 25 separate studies of winter populations. The 25 areas are in states from Maine and Ala. west to Ark. and Colo. Numerous habitats are represented.

Lemieux, Louis. (Can. Wildl. Serv., Quebec, P. Q.) SEVENTH CENSUS OF NON-PASSERINE BIRDS IN THE BIRD SANCTUARIES OF THE NORTH SHORE OF THE GULF OF ST. LAWRENCE. Can. Field-Nat. 70(4): 183-185. Oct.-Dec. 1956 [June 1957].

Mackenzie, J. M. D. THE ENCOURAGEMENT OF BIRDS IN COMMERCIAL PLANTATIONS BY NEST BOXES AND OTHER MEANS. Scot. For. 6: 10-17. 1952. [From J. Anim. Ecol. 26(1).]

"Populations of hole-breeders, resident and migrant, and of treecreepers may be increased by the provision of nest sites. Other species can be increased by appropriate means, but are of less importance. Nest sites are thought to be the normal control, but after they are increased by boxes, the resultant populations are more vulnerable to other limiting factors."

Merikallio, Einari. THE BIOLOGICAL PROVINCES OF FINLAND AND A QUANTITATIVE SURVEY OF THEIR LAND BIRD FAUNA. Arch. Soc. Zool. Bot. Fennicae "Vanamo" 9 (Suppl.): 174-186, illus. 1956. [From Biol. Abs. 31(1).]

In Finnish. Results of transect survey of land birds of Finland, arranged according to so-called biological provinces based upon soil productivity and features of vegetation. Examples of different types of bird distr., density and dominance figures for some spp., discussion of recent changes due to human agencies, and enumeration of 10 commonest bird spp. occurring in Finland. For Fringilla coelebs pair number for total area of Finland was estimated to 5,600,000 and for Phylloscopus trochilus to 6,300,000.--Ernst Palmén.

Yapp, W. B. THE THEORY OF BIRD TRANSECTS. Bird Study 3: 93-104. 1956. [From J. Anim. Ecol. 26(1).]

"Presents a formula for determining the density of organisms in an area on the basis of the numbers encountered in a unit of time, the effective radius of the organism, its average speed and the speed of the observer. The method is more useful for comparative purposes than for absolute determinations."

BIRDS--CONTROL, MORTALITY

Mitchell, Robert T., and John T. Linehan. (Patuxent Refuge, Laurel, Md.) PROTECTING CORN FROM BLACKBIRDS. US F&WS, Wildl. Leafl. 385. 1-7 p., 1 photo. [June 1957.]

Describes kinds of damage, frightening devices, cultural practices to avoid damage, and reduction of injurious populations of birds. Frightening methods are discussed as to technique of application, capacity in terms of area protected, operating cost, and limitations.

Neff, Johnson A., and Brooke Meanley. RESEARCH ON BIRD REPELLENTS / PROGRESS REPORT NO. 2 / BIRD REPELLENT STUDIES IN THE EASTERN ARKANSAS RICE FIELDS. US F&WS, Denver 2, Colo. 1-21 p., mimeo. Apr. 1957.

Tells how screening and field tests were made and discusses results of trials of 64 chemical formulations. Some of the preparations have promise for protecting planted seed or small areas of standing grain.

Pfeifer, Robert P. (Wyo. Agr. Exp. Sta., Laramie.) A BIRD CONTROL APPARATUS FOR EXPERIMENTAL PLOTS. Agron. J. 48(3): 139-141, illus. 1956. [From Biol. Abs. 31(7).]

An effective apparatus to control blackbirds and sparrows from destroying small grain plots was designed and built. It consists of a 30,000 volt 60 milliampere neon light transformer connected to parallel wires spaced at 2 inches. The wires are supported by poles about 12 feet above the plots. The shocking and sometimes killing of the birds effectively scares away flocks of them and the plots are left unmolested.--Author.

Rittinghaus, Hans. ON THE "INDIRECT" DISTRIBUTION OF THE OILPEST IN A SEA BIRD SANCTUARY. Ornithologische Mitteilungen 8(3): 43-46. 1956. [From abstract by R. O. Bender, Bird-Banding 28(2).]

In German. "The author points out that killing birds at sea does not represent oil's only hazard to bird life. When washed ashore on islands where sea and shore birds nest, oil causes considerable additional mortality to adult and young birds."

BIRDS--CONTROL, MORTALITY--Continued

United Nations. POLLUTION OF THE SEA BY OIL. United Nations, N. Y., ST/ECA/41. iii + 235 p. Aug. 1956. $1.50.

Result of questionnaire sent to all coastal nations. It contains little of direct interest to biologists, but it gives some idea of how severe oil pollution is deemed to be in the various countries, what is being done about it, and what organizations are working on the problem. The volume consists of the reply of each country. These replies are broken down under 5 headings: I. Situation with regard to oil pollution; studies and research concerning this problem. II. Facilities in port. III. Facilities on board ships. IV. Instructions concerning methods of avoiding pollution by oil. V. System of regulations. It is interesting to note that some nations apparently have little or no oil pollution, and that many nations, including some highly developed ones, are doing very little about it. Most countries at least have regulations designed to limit oil pollution.

BIRDS--PARASITES AND DISEASES

Rothschild, Miriam, and Theresa Clay. FLEAS, FLUKES AND CUCKOOS. 3d edition. Macmillan, N. Y. xiv + 305 p., illus. 1957. $5.00. [From review by Herbert Friedmann, Science, May 17, 1957.]

Third edition of a famous work by 2 leading specialists on avian ectoparasites. The text is essentially "as in earlier printings, but on pages xiii and xiv are listed the additional data and the changes in qualifications of statements taken from the first edition... The book is divided into three main parts. The first of these includes a general discussion of parasitism, commensalism, symbiosis, the mutual effects and interrelations of parasites and hosts, and the origins of parasitism. The second part deals with fleas and feather lice, while the third part has a much more heterogeneous content; it deals with endoparasites, such as protozoans and worms, and also with ectoparasites such as flies and mites. The latter are grouped here probably because their larvae are subcutaneous parasites of the avian host. From these, the authors go on to include food predator-parasites such as the skuas, and brood parasites, exemplified by the European cuckoo, but the treatment afforded these topics is much less detailed than is the discussion of body parasites."

Worth, C. Brooke, Vincent Hamparian, and Geoffrey Rake. (Wistar Inst., Philadelphia, Pa.) A SEROLOGICAL SURVEY OF ORNITHOSIS IN BIRD BANDERS. Bird-Banding 28(2): 92-97. Apr. 1957.

Summary: "A serological survey for ornithosis was conducted among thirty-five ornithologists, thirty-three of them bird-banders... Thirty-four sera were negative. The single positive specimen came from a youth with minimal experience in bird-banding; he may easily have acquired his infection from a different source, although this could not be ascertained. It is concluded that most species among our native wild birds are not a hazardous reservoir of ornithosis infection."

GAME BIRDS--GENERAL

Sharp, Ward M. (Pa. State U.) SOCIAL AND RANGE DOMINANCE IN GALLINACEOUS BIRDS--PHEASANTS AND PRAIRIE GROUSE. J. Wildl. Mgt. 21(2): 242-244. Apr. 1957.

Observations were made on strife and intolerance within a mixed population of ring-necked pheasants, greater prairie chickens, and sharp-tailed grouse in the Nebr. Sandhills, 1937-1943. Techniques used in fighting were observed and the results of such conflict were recorded. Sharp-tailed grouse were able to dominate both pheasants and prairie chickens. Pheasants dominated prairie chickens but prairie chickens were unable to cope successfully with either sharp-tails or pheasants. Severe competition existed between pheasants and prairie chickens. This competition eventually could eliminate isolated pockets of prairie chickens in the states where they exist.--Author.

Campbell, Howard. (N. M. Dept. Game.) EVALUATION OF WILDLIFE DEVELOPMENTS DEALING SPECIFICALLY WITH WATER DEVELOPMENTS AND ASSOCIATED PRACTICES INITIATED PRIMARILY FOR THE BENEFIT OF QUAIL. N. M. Dept. Game & Fish, Completion Report Project W-70-R, 1-2-3. 1-155 p., illus., proc. 1957. Copies available on request.

Report on 3.5-year analysis of effects of guzzlers and feeding stations on quail in N. M. The guzzlers worked well as water catchments, although the few of the shed-roof type required too much attention. But for scaled quail, Gambel quail, and mourning doves in N. M. the guzzlers did very little good and did not justify their cost. They were of little value even when fenced and equipped with feeders filled mainly with sorgum seed. Quail made little use of feeders; most grain was taken by passerines. It is recommended that the state build no more guzzlers and feeders, unless future evidence is different. Such structures may have some value on small, intensively managed preserves. Gentle-release pens with food and water were ineffective in establishment of game-farm birds and in helping wild birds; they were actually dangerous to doves. Fenced areas of 1-2 acres around food and water units did little good for vegetation (in drought) or for birds. Fencing just the immediate vicinity of a unit would have been as good. Fenced areas of 40 acres or more might have been helpful. Direction in which guzzler faced made no important difference in water storage, water temperature, use by birds, or rate of deposition of debris. Transects walked to get measure of quail populations were abandoned as unreliable. One major conclusion of the paper is that a state should give proposed new management techniques thorough, small-scale trials before launching large programs, even if the techniques have succeeded elsewhere. The paper also reports in detail on food habits of scaled quail as determined from 42 crops.

DeWitt, J. B., R. B. Nestler, and J. V. Derby, Jr. (Patuxent Refuge, Laurel, Md.) CALCIUM AND PHOSPHORUS REQUIREMENTS OF BREEDING BOBWHITE QUAIL. J. Nutrition 39(4): 567-577. Dec. 1949.

Based on studies of captive flock. It is concluded that breeding bobwhites need diets furnishing approximately 1.0% phosphorus and 2.3% calcium.

Elder, James Bruce. ANALYSIS OF FACTORS AFFECTING PRODUCTION AND WHISTLING BEHAVIOR OF THE EASTERN BOB-WHITE, COLINUS V. VIRGINIANUS L., IN DECATUR COUNTY, IOWA. Ph.D. thesis, Iowa State Coll. 1956. [From long abstract in Iowa State Coll. J. Sci. 31(3).]

The portion on whistling behavior has been published. See WR 88: 65.

Gullion, Gordon W. (Nev. Game Comm., Elko.) GAMBEL QUAIL DISEASE AND PARASITE INVESTIGATIONS IN NEVADA. Am. Midl. Nat. 57(2): 414-420, 2 photos. Apr. 1957.

Of 110 blood smears, 62 contained Haemoproteus lophortyx and 3 contained microfilariae. Of 61 quail examined internally, 21 had the nema Aulonocephalus lindquisti and 3 had a cestode, perhaps Rhabdometra odiosa. Ectoparasites included Stilbometopa impressa, Argas persicus, and a larval Ixodes. Six diseases were encountered. One may have been bacterial, one was coccidial, two were from fungus (favus and aspergillosis), and two involved necrosis of the gizzard lining or underlying tissues. None of these parasites and diseases was demonstrated to be of population importance.

Nestler, R. B., J. V. Derby, and J. B. DeWitt. (DeWitt: Patuxent Refuge, Laurel, Md.) STORAGE BY BOBWHITE QUAIL OF VITAMIN A FED IN VARIOUS FORMS. J. Nutrition 36(2): 323-329. Aug. 1948.

Rosene, Walter, Jr. (US F&WS, Gadsden, Ala.) A SUMMER WHISTLING COCK COUNT OF BOBWHITE QUAIL AS AN INDEX TO WINTERING POPULATIONS. J. Wildl. Mgt. 21(2): 153-158, 1 graph. Apr. 1957.

Road counts of calling males were compared with numbers of coveys in following hunting seasons. Work was done 1950-53 on 4 areas in Ala. and 6 in S. C. When data were summarized by year and by state, it was found that increase or decrease in whistling males in summer was followed by similar increase or decrease in coveys during hunting season. "Using this technique, it is possible to predict by physiographic types the number of coveys that will be found in

winter from the number of whistling cocks heard the previous summer, if areas 500-1,700 acres in size are used with a total of at least 12,000 acres. The confidence limits of the prediction increase both below and above the mean."

Warner, Dwain W., and Byron E. Harrell. (U. Minn. Mus. Nat. Hist.) THE SYSTEMATICS AND BIOLOGY OF THE SINGING QUAIL, DACTYLORTYX THORACICUS. Wilson Bul. 69(2): 123-148, 1 pl., 1 map. June 1957.

Comprehensive paper on natural history and subspecies of a forest quail of Mexico and Central Am.

Westerskov, Kaj. (Wildl. Div., Dept. Int. Affairs, Wellington, N. Z.) TAXONOMIC STATUS OF THE BOBWHITE QUAIL IN NEW ZEALAND. Notornis 7(4): 95-98. Apr. 1957.

Determined as C. v. taylori, from central U. S. Area of survival in N. Z. is of comparable latitude. Common name in N. Z. should be bobwhite quail, as it is in America.

PHEASANTS

Stokes, Allen W. (Utah State Agr. Coll.) VALIDITY OF SPUR LENGTH AS AN AGE CRITERION IN PHEASANTS. J. Wildl. Mgt. 21(2): 248-250, 3 figs. Apr. 1957.

Spur length is a frequently used method of separating juvenile from adult pheasants. Errors in this method stem from regional and annual differences in growth rates, time of hatching and of hunting seasons, and per cent of juveniles in population. Standards for use of a spur gauge to separate juveniles from adults should be worked out for each state planning to use this practice.--Author.

Sunde, M. L., and H. R. Bird. (U. Wis.) THE NIACIN REQUIREMENT OF THE YOUNG RINGNECK PHEASANT. Poultry Sci. 36(1): 34-42, 8 figs. Jan. 1957.

Value of niacin in decreasing incidence of a leg disorder of captive chicks. Also comments on rearing methods that favor rapid growth.

Westerskov, Kaj. (Wildl. Div., Dept. Internal Affairs, Wellington, N. Z.) INCUBATION TEMPERATURES OF THE PHEASANT, PHASIANUS COLCHICUS. Emu 56(5): 405-420, 7 graphs. Dec. 1956.

From summary: "Body temperature of the hen Pheasant is 41.8°C., temperature of the bare brood-patch contacting the eggs is 38.5°C. Effective incubation temperature is reached in a few hours after the hen has started sitting. Air temperatures at the top of the eggs under the sitting hen rise slowly and gradually from 33° to 36°C. (mean 35.1°C.), during the incubation period. Air temperatures at the bottom of the eggs rise similarly from 23°C. to 26-27°C. (mean 25.0°C.), but are markedly affected by outside ground temperatures. The hen leaves her nest for about an hour once each day during which period temperatures in the nest drop to atmospheric temperature; the inattentive periods made up 4 per cent of the total incubation period. The eggs are turned once an hour on the average during the whole incubation. When Pheasant eggs are artificially incubated, it may be advantageous to cool them down to atmospheric temperature for about an hour each day and turn them on the average once every hour. Practical testing of these suggestions is needed."

Westerskov, Kaj. (Wildl. Div., Wellington, N. Z.) TAXONOMY, DISTRIBUTION AND HABITAT UTILISATION OF NEW ZEALAND PHEASANTS. N. Z. Dept. Internal Affairs, Wildl. Publ. no. 40A. 79 p., 16 photos, 12 figs. 1956.

Detailed account of certain aspects of author's comprehensive study of Phasianus colchicus. The taxonomic section is an unusually complete account of introductions and cross-breeding of subspecies in Britain. The subspecies, crosses, and mutants are described and discussed. Similar information is given for N. Z. In both lands, wild birds tend to become a ringnecked type which is not true torquatus. The blackneck, however, might be best fitted to N. Z.; it is well represented in present strains there. When possible, introductions should be from areas ecologically similar to release areas. The second part of the paper describes pheasant habitats and their relative pheasant populations in N. Z. The discussion covers seasonal and brood habitats. Comparisons are

made with pheasant habitats and numbers in America. Ideal pheasant habitat is defined, and a plan is offered for rating actual or potential pheasant range in N. Z. This plan should be applicable elsewhere with a little modification.

GROUSE, PARTRIDGE, ETC.

Bendell, J. F., and R. D. Lisk. (U. of B. C., Vancouver.) DISPHARYNX NASUTA IN HUNGARIAN PARTRIDGE IN ONTARIO. J. Wildl. Mgt. 21(2): 238. Apr. 1957.

First record of this nematode in Ont. This and present distribution of partridge suggest some partridge in Ont. originated in Mich.--J. F. Bendell.

Jenkins, David. CAUSES OF DEATH IN PARTRIDGES. Bird Study 2(3): 142-143. 1955. [From abstract by O. L. Austin, Jr., Bird-Banding 27(4).]

"Post mortem examination of 43 adult Perdix perdix found dead near Hampshire over a 3-year period showed 14 to have died from violence, and 31 birds 'to be diseased or to be carrying parasites. In some cases it was impossible to make an exact diagnosis of the cause of death, but in each the infective agent was believed to be potentially lethal. Although these results indicate a fairly heavy incidence of disease in Partridges, it should not be assumed that disease was the primary cause of death.'"

Peterle, Tony J. NOTES ON THE DISPLAY OF THE RED GROUSE. Scottish Nat. 67: 61-64. 1955. [From Biol. Abs. 31(3).]

Observations in Aberdeenshire began in Dec. 1954, and continued until May 1955. The effect of light, temperature, time of day and change of season on red grouse display were recorded. The object of the observations was to determine the peak of display period, with the ultimate goal of utilizing this period to estimate population densities.--Lucile Walton.

TURKEY

Roberts, Harvey A. (Pa. Game Comm.) FACTORS AFFECTING THE WILD TURKEY POPULATION IN PENNSYLVANIA. Pa. Game News 28(6): 15-24, 8 figs. June 1957.

Based on paper presented at Jan. 1957 meeting of NE. Sec. of Wildl. Soc. See WR 88: 71.

DOVES AND PIGEONS

Caldwell, Larry D. (U. Ga.) CROP THICKENING AND SEPTEMBER NESTING OF DOVES. J. Wildl. Mgt. 21(2): 247-248. Apr. 1957.

The thickened condition of mourning dove crops is one of the criteria used to determine if an adult is nesting in the fall. Fifteen (42%) of 36 adults collected in s. Mich. in Sept. had the crop condition at a time when only 4 (10%) of 41 adult pairs on a study area were nesting. Similar ratios of incidence of thickened crop to nesting adults are found in the literature. The samples may have been unconsciously selected for nesting adults with thickened crops but it is also possible that a thickened crop in a Sept. adult does not necessarily mean it is still nesting.--Author.

Downing, Robert L. AN EVALUATION OF GROUND NESTING BY MOURNING DOVES IN NORTHWESTERN OKLAHOMA. M. S. thesis, Okla. State U. 33 p. Aug. 1957.

Ground nests were not unusual. They occurred on any type of slope, in any vegetation, and at any distance from trees. There were 0.025 ground nests per acre on 19 study areas totaling about 1,184 acres. There were 1.80 tree nests per acre in 20 small tree areas totaling about 67.5 acres. No difference in fecundity was noted between tree and ground nesting doves. Nesting success on ground was 29%. Nesting success in trees was 30% in a wooded canyon and 56% about a farmstead and orchard. It was estimated that 59% of doves produced in nw. Okla. were from ground nests. Apparently, however, trees were preferred nesting sites. Provision of more orchard-like stands of trees in the region would favor production of doves.

Hanson, Harold C., and Charles W. Kossack. (Ill. Nat. Hist. Surv., Urbana.) WEIGHT AND BODY-FAT RELATIONSHIPS OF MOURNING DOVES IN ILLINOIS. J. Wildl. Mgt. 21(2): 169-181, 7 figs. Apr. 1957.

Immature doves from different parts of Ill. varied in av. age and in frequency of molt-age classes. Greater differences existed between areas east and west of each other than between areas north and south. Young began to leave home sites after age of 5-6 weeks. Apparently late-summer movements tended to be southwestward, along valleys. Males av. heavier than females from before postjuvenile molt through adulthood. A change in rate of gain in body weight and gains in body fat during postjuvenile life appeared to be associated with molting. This change was most pronounced in period between replacement of 2nd and 4th primaries. Great gains of fat were correlated with fertile soil and availability of corn. Low gains were correlated with poor soil and dependence on seeds of weeds and native plants. Adults collected in Sept. usually had small or moderate amounts of fat. No consistent relationship was apparent between amount of fat, age, and migratory habits.

Jumber, J. F., H. O. Hartley, E. L. Kozicky and A. M. Johnson. (Iowa State Coll.) A TECHNIQUE FOR SAMPLING MOURNING DOVE PRODUCTION. J. Wildl. Mgt. 21 (2): 226-229. Apr. 1957.

A technique for estimating mourning dove production by making counts of doves fledged from nests located in sample blocks of trees is presented for Lewis, Iowa, for 1955. Semimonthly and annual estimates of dove production and standard errors of estimates are given. A comparison of dove production is made between the periods 1938-40 and 1955.—E. Kozicky.

WATERFOWL

Beckwith, Stephen L., and H. Jay Hosford. (U. Fla.) A REPORT ON SEASONAL FOOD HABITS AND LIFE HISTORY NOTES OF THE FLORIDA DUCK IN THE VICINITY OF LAKE OKEECHOBEE, GLADES COUNTY, FLORIDA. Am. Midl. Nat. 57(2): 461-473, 2 graphs. Apr. 1957.

Describes study area and reports on contents of 144 gizzards. Data are also given on weight, size, color differences between sexes, size of flocks, time of mating, nesting, growth of a captive brood, time of postnuptial molt, value of bursa and other age indicators, and occurrence of lead shot in gizzards. [See also WR 83: 50.]

Bednarik, Karl. (Ohio Div. Wildl.) PUBLIC DUCK HUNTING, U.S.A. Ohio Cons. Bul. 21(5): 6-7, 29-32, 2 photos. May 1957.

Questionnaires were sent to all states to find how hunters are selected for the right to hunt ducks on state-owned shooting grounds. Replies are summarized for each state that replied. Methods vary widely. "Of all the various systems of controlled hunting that have been reviewed, the pre-registration lottery type system seems to offer more hunters a more equitable opportunity to participate..." Probably it is also the most expensive system. But if special services are provided, it is only fair that participants should pay.

Bednarik, Karl. (Ohio Div. Wildl.) WEB-FOOTED PIONEERS. Ohio Cons. Bul. 21(6): 10-11, 30-32, 3 photos. June 1957.

Serious, factual review of what waterfowl technicians all over the continent have found about ways of establishing new breeding populations. Reasons for success or failure when using adult waterfowl are analyzed. Overcrowding and use of poor strains are 2 of the reasons. Better success in getting waterfowl to return to desired areas has been obtained with young birds. Much information of this sort is weighed in relation to Ohio's plans for establishing new waterfowl breeding populations. The current plans are described.

Bellrose, Frank C. (Ill. Nat. Hist. Surv.) A SPECTACULAR WATERFOWL MIGRATION THROUGH CENTRAL NORTH AMERICA. Ill. Nat. Hist. Surv. Div., Biol. Notes no. 36. 1-24 p., 9 figs. Apr. 1957.

A dramatic, 4-day southward flight that began in Canada on Oct. 31, 1955 probably was the largest since the one that accompanied the famous Armistice Day blizzard of 1940. Fortunately, many waterfowl biologists were afield at

the time. Their reports are summarized in detail for areas from Canada to La. Weather conditions that prevailed before and during the flight are analyzed extensively and mapped. It is concluded that the flight was triggered by movement of cold air masses that produced snow and ice. However, even lower minimum temperature on Oct. 24 did not affect waterfowl migration as much as a higher minimum did on Nov. 1. "It appears that the cumulative effect of the cold was more important in initiating migration than a single sharp drop in temperature."

Bezubik, Bernard. THE HELMINTH FAUNA OF WILD DUCK (SUBFAM. ANATINAE) OF THE LUBLIN AND BIALYSTOK DISTRICTS. Wiadomości Parazytol. 1956(5 Suppl.): 267-268. 1956. [From Biol. Abs. 31(7).]

In Polish with Russian and English summaries. Between 1945 and 1949 the author examined 278 ducks belonging to 10 spp. Detailed description is given of 36 spp. of parasites (12 flukes, 17 of tapeworms, 3 of Acanthocephala and 4 of nematodes). The total incidence of infection amounts to 73%, and for particular spp. of ducks from 18 to 100%; the intensity of infection varies from a few to over a dozen specimens. The co-occurrence of parasites, the specificity of parasites, the relation of the parasito-fauna to food and season of the year, and anatomo-pathological changes caused by worms are discussed. New host records were obtained for 7 spp; 14 spp. are first records for Poland.--From auth. summ.

Coburn, D. R., J. B. DeWitt, J. V. Derby, Jr., and Ernest Ediger. (DeWitt: Patuxent Refuge, Laurel, Md.) PHOSPHORUS POISONING IN WATERFOWL. J. Am. Pharmaceutical Assn., Sci. Ed., 39(3): 151-158, 11 figs. Mar. 1950.

Black and mallard ducks were highly susceptible to phosphorus poisoning, but with much individual variation. One dose of 3 mg./Kg. of white P killed a black duck drake in 6 hours. Another drake survived 10 daily doses of 1 mg./Kg. until sacrificed on 14th day. Gross and microscopic pathology are described for acute and chronic poisoning. Pathologic alterations of blood are described and illustrated. Gross tissue changes found in field cases were not duplicated in experiments. Chief reasons for the variation are believed to be differences in form and mode of intake of P. Fatty degeneration of muscle, liver, and kidneys was present in all cases. All evidence indicated that field cases were of acute poisoning. Seeming discrepancies between pathological findings and chemical analyses are explained. It is shown that diagnosis of P poisoning can be made accurately by chemical analysis of stored tissues.

Coulter, Malcolm W. (U. Maine.) FOOD OF WOOD DUCKS IN MAINE. J. Wildl. Mgt. 21(2): 235-236. Apr. 1957.

The foods eaten by 65 wood ducks, including 8 flightless young, were examined. The latter fed heavily upon insects. Older birds consumed quantities of wild rice (Zizania aquatica), pondweeds (Potamogeton spp.), burreeds (Sparganium spp.), water bulrush (Scirpus subterminalis) and acorns (Quercus spp.).--Author.

Czapliński, Bogdan. HYMENOLEPIDIDAE FUHRMANN, 1907 (CESTODA) IN SOME DOMESTIC AND WILD ANSERIFORMES IN POLAND. Wiadomości Parazytol. 1956(5 Suppl.): 269-270. 1956. [From Biol. Abs. 31(7).]

In Polish with Russian and English summaries. The paper is based on over 41,000 specimens of tapeworms belonging to 34 spp. found in 468 domestic and wild Anseriformes of 12 spp. and subspp. Five new spp. are described, and supplementary descriptions of most of the previously known forms are given.--From auth. summ.

Fallis, A. M., and D. M. Wood. (Ont. Res. Found., Toronto 5.) BITING MIDGES (DIPTERA: CERATOPOGONIDAE) AS INTERMEDIATE HOSTS FOR HAEMOPROTEUS OF DUCKS. Can. J. Zool. 35(3): 425-435 + 1 pl. June 1957.

Hanson, Harold C. (Ill. Nat. Hist. Surv., Urbana.) A THREE YEAR SURVEY OF ORNITHOFILARIA SP. MICROFILARIAE IN CANADA GEESE. J. Parasit. 42(5): 543. Oct. 1956.

369 immature geese from Horseshoe Lake, Ill., had infection rates of between 19-29% in different years. Time of infection and effect on health should be studied.

Hilprecht, A. HÖCKERSCHWAN, SINGSCHWAN, ZWERGSCHWAN. Die Neue Brehm-Bücherei, A. Ziemsen Verlag, Wittenberg Lutherstadt. 151 p., 47 photos., 12 figs. 1956. 3.75 DM. [From review by Frank McKinney, Auk 74(2).]

"This monograph on the Mute Swan (Cygnus olor), Whooper Swan (C. cygnus), and Bewick's Swan (C. bewickii) will prove a most useful work of reference. Among the subjects dealt with are distribution, molt, size and weight, breeding biology, food, and migration. There are many interesting photographs and a five-page bibliography."

Jones, N. G. Blurton. CENSUS OF BREEDING CANADA GEESE 1953. Bird Study 3: 153-170. 1956. [From J. Anim. Ecol. 26(1).]

In Britain. "Data largely from B.T.O. census returns and from wildfowl counts. Relates with few exceptions to feral birds, the species being introduced from America at intervals since at least 1678. Detailed locality records listed, the total population being between 2600 and 3600. Discusses habitat, breeding, food, predation and movements. Concludes that the species has filled an unoccupied, grazing niche and is controlled by no natural predator. It is occasionally limited by mass egg destruction by humans."

Labisky, Ronald F. (US F&WS, Minneapolis, Minn.) RELATION OF HAY HARVESTING TO DUCK NESTING UNDER A REFUGE-PERMITTEE SYSTEM. J. Wildl. Mgt. 21(2): 194-200, 2 figs. Apr. 1957.

Discusses the problem of duck-nest destruction caused by haying operations on Horicon Natl. Wildl. Ref., Wis. Cropland is managed on a share-cropping basis; all legume hay goes to permittees so the refuge can retain as much corn as possible to feed ducks and geese. Mowing of the first hay crops preceded the major period of hayfield-duck hatching in 1954 and 1955. It caused 100% destruction of all hayfield nests active at that time. Islands of uncut hay--25 ft. square or larger--surrounding duck nests allowed a hatching success of 64%, but duck nests were difficult to find and a flushing rope was only 57% efficient. 90% of hayfield-duck nests were concentrated along 3 mi. of farm units located immediately adjacent to the marsh. Under existing management policies, the soundest recommendation to reduce hayfield-nest mortality is to manage the farm units with high nesting densities specifically for ducks. This would involve delaying the first hay cutting until most nests had hatched. Permittees of these particular farm units would have to be compensated for the total or partial loss of the first legume-hay crop by a larger share of refuge-grown corn or grain. Growing the first legume-hay crop for seed may provide the solution.--Author.

Levine, N. D., D. T. Clark, and L. E. Hanson. (U. Ill.) ENCEPHALITIS IN A SWAN DUE TO DENDRITOBILHARZIA SP. (TREMATODA; SCHISTOSOMATIDAE). J. Parasit. 42(5): 496-500, 5 figs. Oct. 1956.

Low, Seth H. WATERFOWL BANDING IN THE CANADIAN PRAIRIE PROVINCES. US F&WS, Spec. Sci. Rep.--Wildl. no. 36. 1-30 p., 1 map. June 1957.

Waterfowl-hunting regulations must be based on predictions of numbers of birds that will enter each flyway. This necessitates knowing where ducks of a given breeding area will go in migration. For this purpose, birds of important sampling areas (strata) were banded in large numbers with care to distinguish truly local birds. This paper analyzes the results of first-year, direct recoveries of ducks banded in 1954 and 1955. It is shown that although travels were similar in both years there were significant differences. Proportions of birds of a given area that were bagged in a given flyway varied between the years. Distribution to the flyways is not entirely predictable. But fall weather in the 2 years was extremely different and definitely affected results. An average of the 2 years might represent the normal condition, but it seems likely that banding data for 4 or 5 years should be obtained from each of the important breeding areas before the data can be considered satisfactory.

Lundin, Allan, and Göran Hansson. A CENSUS OF MUTE SWANS IN UPPLAND THE SUMMER OF 1955. Vår Fågelvärld 15(1): 44-48. 1956. [From abstract by Louise de K. Lawrence, Bird-Banding 27(4).]

Swedish with English summary. On methods and results of aerial survey. "In all 406 swans were counted in 65 different localities, in 35 of which 73 birds were occupying nests. Many swans, evidently non-breeders, kept together in

flocks off the nesting grounds; as many as 135 such birds were seen in one spot. Careful planning is needed for such a survey, especially in regard to the growth of vegetation and the time in the nesting cycle. A cruising height of 100 to 150 meters proved most ideal. For censusing white birds the weather should be cloudy as the reflections of light and of white clouds on sunny days proved greatly confusing."

Odin, Clyde R. (Utah State Agr. Coll., Logan.) CALIFORNIA GULL PREDATION ON WATERFOWL. Auk 74(2): 185-202, 4 figs. Apr. 1957.

The breeding population of these gulls on 2 waterfowl areas in Utah increased from about 4,000 to 10,800 in the period 1942-50. Study revealed that 18.3% of eggs in 317 waterfowl nests were destroyed by California gulls. Predation was much heavier on poorly hidden nests than on well hidden ones. Gulls also preyed on young waterfowl, but to an unknown extent. Duck broods decreased 40% on the av. by time young were 3/4 grown. Results of study of food habits of the gull are reported. Remains of waterfowl eggs or young were found in 18 of 90 gull stomachs. Greatest predation occurred during June, when gulls apparently destroyed about 30% of waterfowl eggs and young. Predation dropped off greatly by July 14. Rational control of the gulls is recommended for the waterfowl breeding areas that were studied.

CRANES, RAILS, SHOREBIRDS

Boyd, J. M. FLUCTUATIONS OF COMMON SNIPE, JACK SNIPE AND GOLDEN PLOVER IN TIREE, ARGYLLSHIRE. Bird Study 3: 105-118. 1956. [From J. Anim. Ecol. 26(1).]

"Analysis of game records of the Tiree estate over 25 years, including unbroken records between 1929 to 1939 and 1945 to 1954, provides evidence of annual and monthly fluctuations over the shooting season. Correlated review of weather conditions during the migratory season throws some light on the influence of wind direction on movement into the island."

Hawksley, Oscar. (Central Mo. State Coll., Warrensburg.) ECOLOGY OF A BREEDING POPULATION OF ARCTIC TERNS. Bird-Banding 28(2): 57-92, 4 figs. Apr. 1957.

Long comparative study based on work at Machias Seal Island, Bay of Fundy, New Brunswick, in breeding seasons of 1947-48. It discusses arrival dates, foods, effects of weather and light, nesting sites, relations with other birds, predators, egg gathering, parasites, clutch size, incubation, hatching success, fledging success, nonbreeding and desertion, effects of habitat changes on populations, and what can be done to improve breeding areas by controlling vegetation and predators. Clutch size av. less than 2; a pair seems unable to rear more than 1 chick. Fledging success was 34.7%, but 47.6% of pairs succeeded in fledging a chick. Estimates indicated that the colony was increasing despite some egg gathering and disturbance by livestock.

Rooth, J. PROBLEMS AROUND THE ARCTIC TERN (STERNA MACRURA) IN CONNECTION WITH OBSERVATIONS MADE ON THE ISLE OF GRIEND (NETHERLANDS). Levende Natuur 58 (7): 137-140, illus. 1955. [From Biol. Abs. 31(7).]

In Dutch. The little Isle of Griend in the Dutch Waddensea is a bird sanctuary where tens of thousands of common terns and Sandwich terns nest. The Arctic tern is also nesting there, and in increasing numbers (now about 2500 nests). The common tern and the Arctic tern are very closely related and ecologically almost identical. Still there is no indication that the one species ousts the other. They neither occupy a different territory, nor do they use different food. Evidence is adduced that these closely related species can co-exist because of the spreading of the nesting season, which leads to a lower degree of competition at the time the newly born young require much food. The Arctic tern winters at a much greater distance from the nesting site than the common tern, arrives later, and incubates some 3 weeks later than the common tern, at least on the Isle of Griend.--P. Korringa.

OTHER BIRDS

Dixon, James B., Ralph E. Dixon, and James E. Dixon. (Escondido, Calif.) NATURAL HISTORY OF THE WHITE-TAILED KITE IN SAN DIEGO COUNTY, CALIFORNIA. Condor 59(3): 156-165, 5 figs. May-June 1957.

Food, hunting methods, nesting sites, nests, breeding behavior, relations with other predatory birds and crows, egg-laying, incubation, young, second nestings, roosting behavior. Both this kite and the red-shouldered hawk have increased in n. San Diego Co. despite a large increase in human population. The kite, rare in the area a few years ago, is now a common breeder. Both kite and hawk seem able to adapt to changing conditions and are expected to persist as long as their food supply is not eliminated.

Gullion, Gordon W. (Austin, Nev.) TWO RECORDS OF UNPROVOKED ATTACK BY GOLDEN EAGLES. Condor 59(3): 210-211. May-June 1957.

Twice, a year apart, author was attacked by immature golden eagles in remote parts of Mt. Rainier Natl. Park. The eagles persisted in their attacks. Apparently they were inexperienced individuals misjudging size and nature of prey.

Hagen, Arthur F., and O. Wilford Olsen. (Colo. State U., Fort Collins.) SPECIES AND PREVALENCE OF PARASITES IN THE BLOOD OF THE AMERICAN MAGPIE (PICA PICA HUDSONI (SABINE)) IN NORTHERN COLORADO. Proc. Helminth. Soc. Wash. 24 (1): 61-62. Jan. 1957.

Hoyt, Sally F. (Lab. Ornith., Cornell U.) THE ECOLOGY OF THE PILEATED WOODPECKER. Ecology 38(2): 246-256. Apr. 1957.

Abundance near Ithaca, N. Y.; food and feeding habits; voice; roosting; nesting habitat and requirements; courtship; display; nest; eggs; incubation; parental care; parasites; economic importance; status of species. Once rare and decreasing, the species seems to be adapting to present conditions and increasing.

Löhrl, Hans. THE STARLING AS A COMPETITOR FOR NEST HOLES. Die Vogelwelt 77(2): 47-50. 1956. [From long abstract by Frances Hamerstrom, Bird-Banding 28(2).]

In German. Starlings compete successfully with woodpeckers, and regularly take over holes as soon as they are made, chasing off the woodpeckers. Starlings may or may not use all the holes they usurp. Nuthatches often are more successful in dealing with starlings; nuthatches fill part of the entrance hole with hard mud, making it difficult and sometimes impossible for a starling to enter.

Meanley, Brooke. (P. O. Box 1365, Alexandria, La.) BANDING BLACKBIRDS IN A RICE FIELD RESERVOIR ROOST. Bird-Banding 27(4): 170-171, 1 photo. Oct. 1956.

Thousands of birds were banded at night from a small boat. The birds were much less restless on dark nights than on moonlit nights.

Moore, N. W. THE PAST AND PRESENT STATUS OF THE BUZZARD IN THE BRITISH ISLES. British Birds 50(5): 173-197, 5 figs. May 1957.

Buteo buteo was very common in Britain in the early 19th century. By 1914, it had become relatively scarce and local owing largely to persecution by game keepers. After 1914, it increased and occupied much of its old range. The B. buteo population of British Isles in 1954 was estimated as between 20,000 and 30,000 birds. Av. breeding density was 0.14 pairs per sq. mi., with maximum of 6.2 pairs per sq. mi. Density was highest in w. Britain, and in areas where agricultural land was mixed with moorland or forest. Populations were believed to be limited by persecution, availability of food and nesting sites, and by territorial behavior. The species is not likely to control populations of any prey or competitor species. The population declined when myxomatosis swept away rabbits, but soon stabilized at a somewhat lower level. Future of the bird depends mainly on public attitudes in game keeping.

Preble, Norman A. (NE. U., Boston, Mass.) NESTING HABITS OF THE YELLOW-BILLED CUCKOO. Am. Midl. Nat. 57(2): 474-482. Apr. 1957.

Barbour, Roger W. (U. Ky.) A STUDY OF THE COTTONMOUTH, ANCISTRODON PISCIVORUS LEUCOSTOMA TROOST, IN KENTUCKY. Trans. Ky. Acad. Sci. 17(1): 33-41. 1956. [From Biol. Abs. 31(4).]

Cottonmouths collected in Hickman and Muhlenberg counties av. 700 mm. in length. They were found in cypress swamps, oxbow lakes, bayous and sluggish streams in w. Ky.; a swampy area known as Murphy's Pond was most extensive habitat. Population of 300 cottonmouths per acre was estimated for sections of swamp. From late Aug. or early Sept. to Mar. or Apr. they hibernated in low wooded hillsides adjacent to swamp. Two-thirds of food was made up of Siren intermedia and frogs (Rana), remainder being fishes, reptiles and other amphibians. Females gave birth to 2 to 10 young on wooded hillsides shortly before hibernation. The snakes have little economic significance in Ky., for habitat is an isolated area unfit for human habitation.--R. H. Weaver.

Barbour, Roger W. (U. Ky.) THE SALIENTIA OF KENTUCKY: IDENTIFICATION AND DISTRIBUTION. Trans. Ky. Acad. Sci. 17(2): 81-87. 1956. [From Biol. Abs. 31(4).]

A key for the identification of spp. and sspp. is included.

Bellairs, Angus d'A. (U. London.) REPTILES. Rinehart & Co., N. Y. 16, N. Y. 195 p., illus. 1957. $1.50. [From Biol. Abs. 31(7).]

A compressed account of the reptile group, Order Reptilia, addressed to students of general zoology and naturalists, as well as to herpetologists. The text draws especially upon the literature since 1940, and the bibliography accordingly includes mainly the more recent references. The general anatomy and physiology are treated in an introductory chapter and under the heading The Reptile Body (46 p.); origin, radiation, and classification form chapter 3 (8 p.); chapter 4 (12 p.) treats the tortoises and turtles; chapter 5 the ancestors of mammals (11 p.); chapter 6 (8 p.) deals with the ichthyosaurs, plesiosaurs, and other extinct groups; chapter 7 (13 p.) discusses the primitive archosaurs and crocodilians; chapter 8 (10 p.) is devoted to the 2 orders of dinosaurs; flying reptiles and the origin of birds are discussed in chapter 9 (8 p.); the tuatara and the ancestors of lizards are the subject matter of chapter 10 (5 p.); chapter 11 (22 p.) deals with the classification of the lizards and snakes; and chapter 12 (35 p.) with the biology of these 2 groups, which comprise the great majority of living reptiles. The chapters are illustrated by numerous new or redrawn figures.—K. P. Schmidt.

Bellis, Edward D. (U. Minn.) THE EFFECTS OF TEMPERATURE ON SALIENTIAN BREEDING CALLS. Copeia 1957(2): 85-89, 6 graphs. July 1957.

Bragg, Arthur N. (U. Okla.) NOTES ON THE BEHAVIOR OF TOADS IN CAPTIVITY. Wasmann J. Biol. 14(2): 301-310, 1 photo. Fall 1956.

Observations on habits, burrows, times of activity, etc., for various species of Bufo and Scaphiopus.

Bragg, Arthur N. (U. Okla.) AGGREGATIONAL FEEDING AND METAMORPHIC AGGREGATIONS IN TADPOLES OF SCAPHIOPUS HURTERI, OBSERVED IN 1954. Wasmann J. Biol. 15(1): 61-68, 4 photos. Spring 1957.

Bresler, Jack Barry. ECOLOGICAL STUDY OF CHARACTERISTICS IN RANA PIPIENS. Ph.D. thesis, U. Ill. 91 p. 1957. [From long abstract in Dissertation Abstracts 17(5).]

This scientifically and economically important frog has defied taxonomically satisfactory treatment. In the present study, measurements and ratios were taken from samples from widely separated areas. Correlations of these with various habitat factors were analyzed. Precipitation and temperature were major factors determining the frogs' choice of habitats. Changes in structure appeared to be related strongly to changes in temperature and altitude and moderately related to latitude. Body length increased with temperature of area up to 75-79°F., then decreased. Length also decreased as altitude increased. Two ratios proved independent of body length and therefore suitable for comparison of individuals of different size. No external character was always adequate for identifying sex. The species has great "variation for each structure which at first appears to be independent of geographic distribution. The

second level of recognizable larger trends is superimposed over these variations. These trends are centered primarily around physical factors. It is not believed advisable at the present stage of Rana pipiens evolutionary development to divide the complex into additional species or subspecies."

Caldwell, David K., Archie Carr, and Thomas R. Hellier, Jr. (U. Fla.) NATURAL HISTORY NOTES ON THE ATLANTIC LOGGERHEAD TURTLE, CARETTA CARETTA CARETTA. Quart. J. Fla. Acad. Sci. 18(4): 292-302. 1956. [From Biol. Abs. 31(1).]

Caldwell, David K., Archie Carr, and Thomas R. Hellier, Jr. (U. Fla.) A NEST OF THE ATLANTIC LEATHERBACK TURTLE, DERMOCHELYS CORIACEA CORIACEA (LINNAEUS), ON THE ATLANTIC COAST OF FLORIDA, WITH A SUMMARY OF AMERICAN NESTING RECORDS. Quart. J. Fla. Acad. Sci. 18(4): 279-284. 1956. [From Biol. Abs. 31(1).]

Eakin, Richard M. (U. Calif., Berkeley.) USE OF COPPER WIRE IN NOOSING LIZARDS. Copeia 1957(2): 148. July 1957.

Gentry, Glenn. AN ANNOTATED CHECK LIST OF THE AMPHIBIANS AND REPTILES OF TENNESSEE. J. Tenn. Acad. Sci. 30(2): 168-176 (Amphibians). 30(3): 242-251 (Reptiles). 1956. [From Biol. Abs. 31(5).]

Includes 154 spp. native to Tenn. Common names used are those local in Tenn. The list was compiled from field notes taken over a 20-year period. Ranges of several spp. are extended. The bibliography includes all known contributions by herpetologists who have made special studies in Tenn.--From author's abstract.

Gordon, Robert Edward. THE BIOLOGY AND BIODEMOGRAPHY OF ANOLIS CAROLINENSIS CAROLINENSIS VOIGT. Ph. D. thesis, Tulane U. 274 p. 1956. [From long abstract in Dissertation Abstracts 17(3).]

Populations e. and w. of Miss. R. near New Orleans were compared. Animals were studied by marking, censusing, and other means. Data were obtained on habitat selection, reproduction, growth, mortality, movement, and social behavior. Some of the findings follow. Significant differences between populations were demonstrated in 3 of 4 scale characters. Various differences in population biology were attributed to ecological differences of the 2 habitats. Rapid changes in age composition and residency resulted in 100% turnover in an annual cycle. Crude densities varied from 0 to 109 and 176 individuals per 0.1-acre quadrat during annual cycle. Anoles were active at air temperatures of 60°F. or more, torpid at 55° or less. Aggressive behavior was lacking in early winter, facilitating formation of hibernating aggregations. Maximal travels recorded were for trips to and from wintering sites. Adult males held exclusive ranges. A maximum of 4 females was observed on a territory. Females laid 6-9 eggs per season. Rain seemed to stimulate egg laying by many females at same time. Growth was rapid; males may become sexually mature in about 2 months. Both sexes reached adult size before their second winter. Mortality was associated with sudden temperature declines following periods of warmer winter weather. Probably few anoles survive more than 3 years in wild. Information is also given on size at hatching and sexual maturity, breeding season, sites of egg laying, incubation period, sex ratios, and enemies.

Gosner, Kenneth L., and Irving H. Black. (Newark Mus., Newark, N. J.) THE EFFECTS OF ACIDITY ON THE DEVELOPMENT AND HATCHING OF NEW JERSEY FROGS. Ecology 38(2): 256-262, 1 fig. Apr. 1957.

Karlstrom, Ernest L. (Augustana Coll., Rock Island, Ill.) THE USE OF Co^{60} AS A TAG FOR RECOVERING AMPHIBIANS IN THE FIELD. Ecology 38(2): 187-195, 6 figs. Apr. 1957.

Much useful information on preparing the tags and using them in field study of toads.

Knepton, James C., Jr. (Memphis State Coll., Tenn.) COUNTY RECORDS OF TESTUDINATA IN GEORGIA. J. Tenn. Acad. Sci. 31(4): 322-324. 1956. [From Biol. Abs. 31(5).]

Neill, Wilfred T. (Ross Allen Reptile Inst., Silver Springs, Fla.) SOME MISCONCEPTIONS REGARDING THE EASTERN CORAL SNAKE, MICRURUS FULVIUS. Herpetologica 13(2): 111-118. July 1957.

The snake is chiefly diurnal, contrary to common statements. It lives mostly in rather dry, fairly open habitats but also in hammock forest. Lengths of 44 in. are not rare in parts of Fla. and the record is 47.5 in. As many as 13 eggs may be laid. Temperament is rather irritable, not docile as often described. Twenty reports of bites are described and others are cited. Mortality of people from coral snake bites runs around 20%. At least half of all bites result from snakes being picked up or otherwise touched or manipulated.

Parrish, H. M., J. E. Scatterday, and C. B. Pollard. (Scatterday: Fla. State Bd. Health, Jacksonville.) THE CLINICAL MANAGEMENT OF SNAKE VENOM POISONING IN DOMESTIC ANIMALS. J. Am. Vet. Med. Assn. 130(12): 548-551, 1 fig. June 15, 1957.

Summary: "1) The four kinds of poisonous snakes found in the United States are listed, along with a discussion of the pathological and toxic effects produced by their venoms. 2) The use of a tourniquet and incision and suction are recommended as the first aid treatment of poisonous snake bites in animals. 3) In addition, the 'three A's' (antivenin, antibiotics and antitoxin) are suggested as the medical treatment. 4) Cortisone and ACTH may prolong life but have not affected the mortality rate. 5) Epinephrine hydrochloride, meperidine hydrochloride (Demerol), calcium gluconate, intravenous solutions, and blood transfusions may prove beneficial." Authors feel that "L-C method" should be rejected in toto until there is better evidence that it is not harmful and that it is beneficial.

Reed, Clyde F. (10105 Harford Rd., Balt. 34, Md.) CONTRIBUTIONS TO THE HERPETOLOGY OF MARYLAND AND DELMARVA, 12: THE HERPETOFAUNA OF ANNE ARUNDEL COUNTY, MD. J. Wash. Acad. Sci. 47(2): 64-66. Feb. 1957.

List of localities and specimens for 47 spp., some of which are new records.

Reed, Clyde F. (10105 Harford Rd., Balt. 34, Md.) CONTRIBUTIONS TO THE HERPETOLOGY OF VIRGINIA, 3: THE HERPETOFAUNA OF ACCOMAC AND NORTHAMPTON COUNTIES, VA. J. Wash. Acad. Sci. 47(3): 89-91. Mar. 1957.

List of localities and specimens. The counties are the s. part of the Delmarva Peninsula.

Rosenthal, Gerson M. THE ROLE OF MOISTURE AND TEMPERATURE IN THE LOCAL DISTRIBUTION OF THE PLETHODONTID SALAMANDER ANEIDES LUGUBRIS. U. Calif. Publ. Zool. 54(6): 371-420, 20 figs. Apr. 1957. $1.00.

Good field and laboratory study of moisture and temperature preferences and relationships of this salamander, with special consideration of how these relationships affect distribution. Considerable information is given on behavior in connection with moisture and temperature conditions.

Schwartz, Albert. (Albright Coll., Reading, Pa.) VARIATION AND NATURAL HISTORY OF PLETHODON JORDANI CLEMSONAE BRIMLEY. Copeia 1957(2): 94-107, 1 pl., 1 graph. July 1957.

INVERTEBRATES

Crocker, Denton W. (Colby Coll., Waterville, Maine.) THE CRAYFISHES OF NEW YORK STATE (DECAPODA, ASTACIDAE). N. Y. State Mus. & Sci. Serv., Bul. no. 355. 1-97 p., 6 pl., 7 figs. May 1957.

A thorough scientific treatment of the 8 species of crayfish known to occur in N. Y. It includes explanations and figures of technical characteristics, key to adults, descriptions, life histories, and analyses of distribution. The monograph is based largely on a Cornell doctoral dissertation.

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